

WINTER 1960 EDITION

50 CENTS

# AIR PROGRESS

HUNDREDS OF PHOTOS • SCALE VIEWS • CUTAWAYS • DATA

OPERATIONAL BOMBERS of the SOVIET AIR FORCE

Pete Bowers' "Specials":  
Marking Errors... Curtiss Flying Boats...  
"Forgotten Fighters" of the U.S. Navy

"ACCIDENT REPORT" — Did Somebody  
Get Their Aircraft Mixed Up?

ЛУЧШИЕ  
ГОДОВЫЕ  
ПУБЛИКАЦИИ  
1950х 1960х

Atoms in Flight...  
Convair Designs  
Nuclear Powered  
U.S.A.F. Aircraft

The Plane That "Sold" Air Travel

It Flew With  $2\frac{3}{4}$  Horsepower!  
Doug Rolfe Details the Ultra-Light "Wren"

Japanese Aircraft Markings

THE CESSNA STORY...

From Clyde Cessna's 1911 Monoplane to  
IFR Copters and Jet-Powered "407"

50 CENTS

AIR PROGRESS — HISTORY OF AVIATION — WINTER 1960 EDITION

50 CENTS





Hindustan Aircraft of Bangalore, India, not only makes this two-place "Pushpak" lightplane for training and club use, but the powerplant, too: PE-95 Mk.1 flat-four developing 90 hp. Bottom of page—Fiat G-91 T-3 developed from NATO lightweight G-91 tactical fighter is 2-seat trainer.

# Air Progress

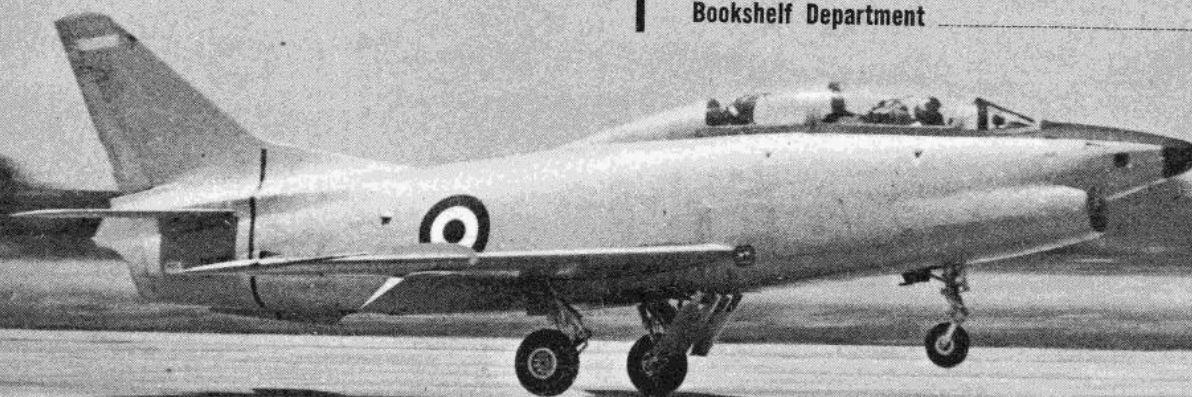
HISTORY OF AVIATION  
WINTER 1960 EDITION

|                      |                  |
|----------------------|------------------|
| Editor               | Albert L. Lewis  |
| Technical Editor     | H. S. Leumann    |
| Art Director         | Otis I. Wells    |
| Editorial Production | Rose Borello     |
| Scale Views Editor   | James M. Triggs  |
| Modern Planes Editor | Howard Levy      |
| Early Planes Editor  | Peter M. Bowers  |
| Book Editor          | William J. Lowry |
| Spacecraft Editor    | S. Calhoun Smith |

## CONTENTS

SPRING 1961 EDITION  
OF AIR PROGRESS WILL  
BE ON SALE FEB. 1961

|                                                   |    |
|---------------------------------------------------|----|
| Pictorial Air Review                              | 4  |
| Accident Report by Frederic Howard                | 12 |
| Albatros Triplane Three View by Walt Musciano     | 18 |
| The Plane That Sold Air Travel by Douglas Ingells | 19 |
| Continental A-65-8 by James Triggs                | 25 |
| Russian Bombers by Major George Geiger            | 26 |
| Forgotten Fighters by Peter Bowers                | 34 |
| The Cessna Story                                  | 46 |
| Curtiss HS-1 Flying Boat by Peter Bowers          | 67 |
| English Electric "Wren" by Douglas Rolfe          | 72 |
| Marking Errors by Peter Bowers                    | 74 |
| Dyna Soar                                         | 77 |
| Japanese Aircraft Markings by Richard Bueschel    | 78 |
| Bookshelf Department                              | 90 |



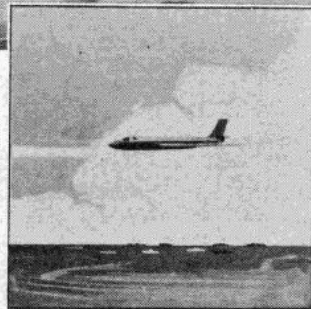
AIR PROGRESS, WINTER 1960, published by Street & Smith Publications, Inc., 575 Madison Ave., New York 22, N. Y.; President Arthur Z. Gray; Vice President and Advertising Director, Robert E. Parks; Secretary and Treasurer, Thomas H. Kaiser; Air Progress Advertising Mgr., Walter J. McBride, 575 Madison Ave., NYC 22; Mid-Western Advertising Mgr., Frank C. Smith, 65 East South Water St., Chicago 1, Ill.; West Coast Advertising Representative, Aaron D. Viller & Associates, 8217 Beverly Blvd., Los Angeles 48, Calif. Copyright © 1960, by Street & Smith Publications, Inc. All rights reserved. Printed in U.S.A. 50c per copy in U.S. and Possessions; 50c per copy in Canada; \$1 per copy elsewhere. ALL COMMUNICATIONS TO THE EDITOR should be addressed to Air Progress, 575 Madison Avenue, New York 22, N. Y. We cannot accept responsibility for unsolicited manuscripts or art work. Include return postage with all contributions. In any fiction story no actual persons are designated by name or character; any similarity is coincidental.



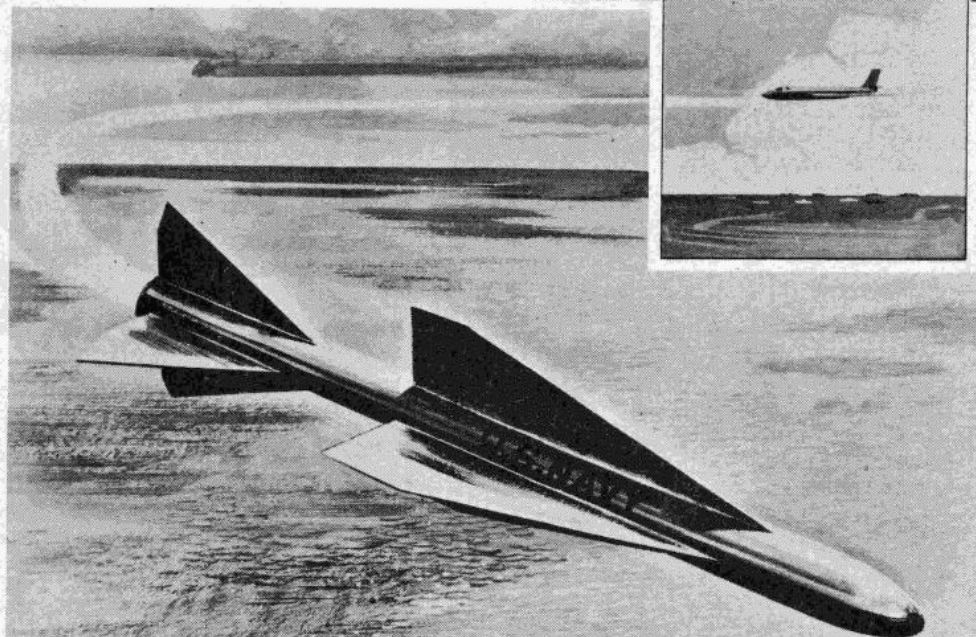


King-size striking power for Navy's midget Douglas A4D Skyhawk available via multiple bomb rack adapter. Will become operational on USN's fleet of nuclear weapons toting Skyhawks.

LEFT, CENTER: Found Brother' all-metal 4-place bush plane, FBA-2A, uses 250 hp Lycoming power. Canadian craft spans 36 feet, length 24.3 feet, 180 square foot wing area.



Rhein RW-3 "Multoplane" (above) is now flying in U.S. Two-blade prop mounted in slot between fin and rudder is driven by 95 hp Continental. German craft can be ordered as 34' 2" span sportplane or 50½' span power-assist sailplane.



Artist's conception of Navy's Eagle missile (left) for air-to-air long range defense. This is part of USN "Missileer" program. Douglas is producing plane, Bendix and Grumman the missile.

Harvey Mace's "Macerschmitt" is husky home-built from Sacramento, Calif. Climbs 2000'/min. on 125 hp Lycoming. Taperwing spans 16½', length 17' 9", empty weight, 685 lbs. Top speed 170 mph.



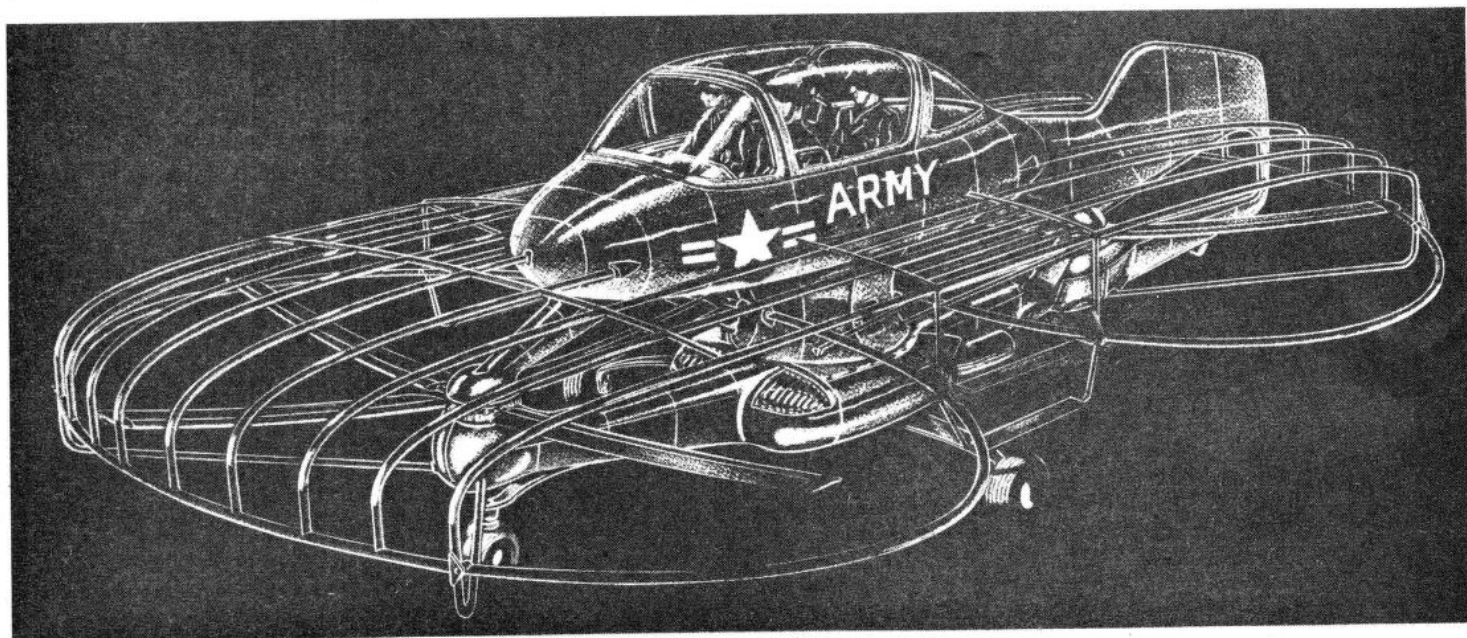




## PICTORIAL REVIEW

Swiss flying belt design (above) revived in Canada by Arnold Junker of Quebec. Rotor diameter 16', weight 105 lbs. Original pulse jet tip units were Japanese. First model destroyed in crash, pilot not seriously hurt.

Gyrodyne's latest ground effects machine (GEM) at right. This earth-hugging saucer uses Porsche powerplant. Round-up of GEM craft appeared in Spring 1960 edition of "Air Progress" on pages 32, 33, and 34.

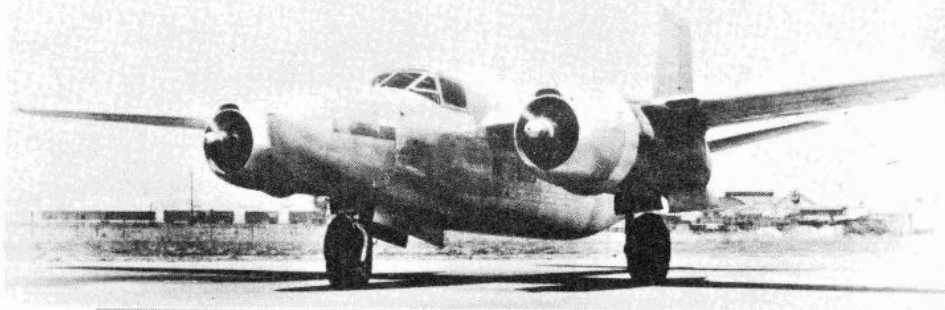


Kellett Aircraft's new type aerial jeep (above) for Army eliminates fore and aft ducts, uses guard rings instead to overcome pitching tendencies at forward speeds which came from asymmetrical flow of air over ducts.

With Pratt & Whitney JT3D turbofan engines Boeing 707-120B makes maiden flight (below). Maximum cruising speed raised to 610 mph. Large fan at engine's front, pushes air past as well as through it.







Douglas A-26B bomber converted into luxurious, high-speed transport (left) by Rhodes Berry Co. Called "Silver Sixty," seats 14 passengers plus crew of 2. Stand-up head-room achieved by adding deeper lower-half fuselage. Does 300 mph plus with Pratt & Whitney R-2800's.

"Jaycopter" helicopter simulator developed in Edmonton, Canada, permits students to "fly" circles 100' in diameter and to altitudes of 76'. Fuselage has unrestricted rotation of 360 degrees as does the boom. Saves \$80 per hour in training costs.

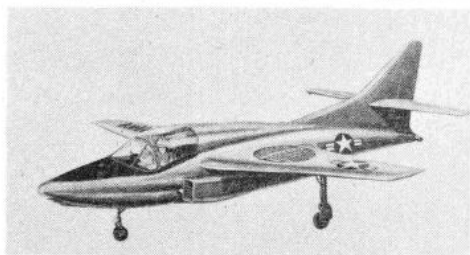
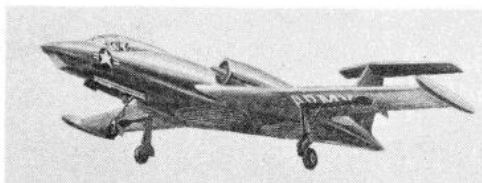
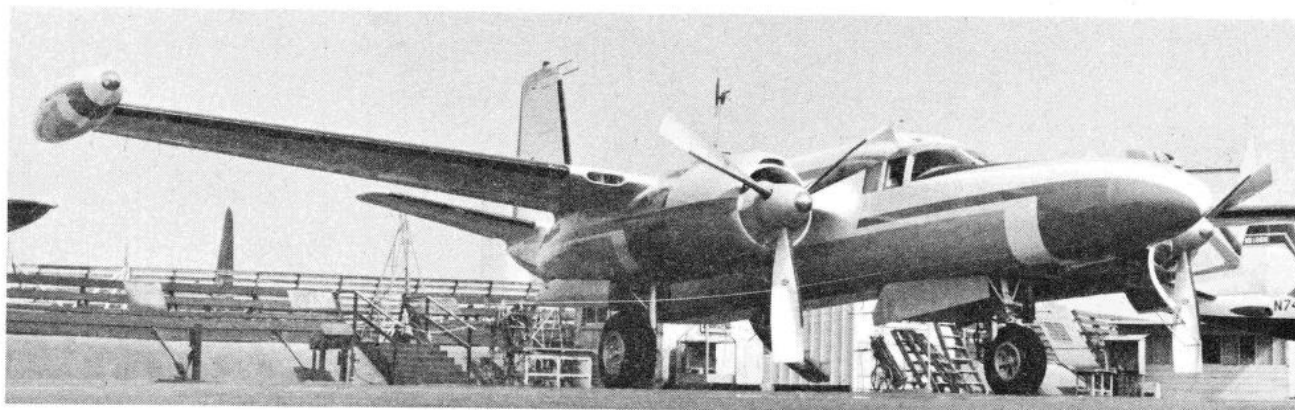




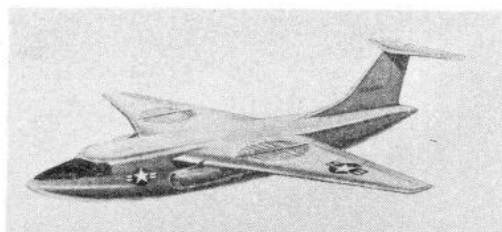


McDonnell Aircraft revamped its USAF competition light jet transport into business offering above. Model 220 using 4 Westinghouse J-34 turbojets can carry 10 passengers at 570 mph top speed, to 40,000 feet, over 2,100 mile range. New light aft-fan CF-700's by G.E. may be installed.

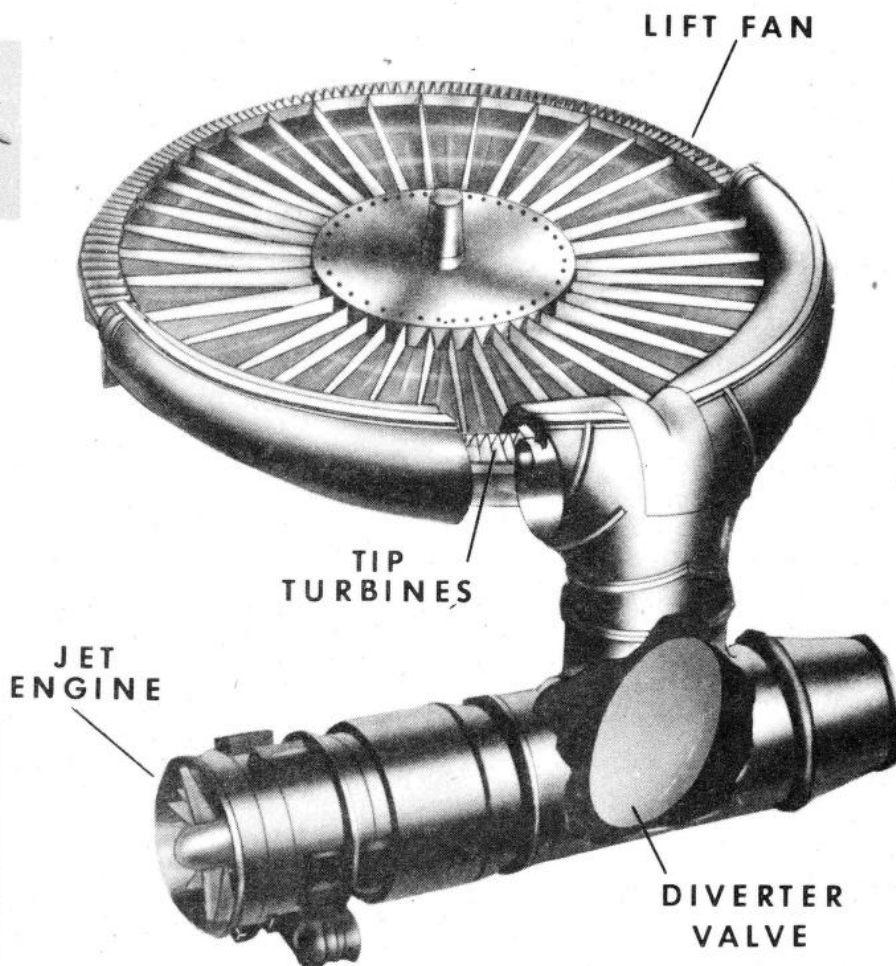
L. B. Smith's "Tempo II" is another reworked Douglas A-26 with pressurized, air-conditioned cabin. Stand-erect, walk-through 28' interior; 10 passengers. 2000-2500 hp P&W R-2800's, cruises 350 mph, top above 400. Range 2400 mi.; ceiling 29,600; \$440,000.



"Lift fan" propulsion system by G.E. multiplies thrust of conventional turbojet for vertical lift. Using lift fan, 2500-lb thrust J-85 develops 7500-lb lift for vertical flight. VTOL possibilities with power plant from top: observation, front line photo-recon job, transport.



AIR PROGRESS — Winter 1960

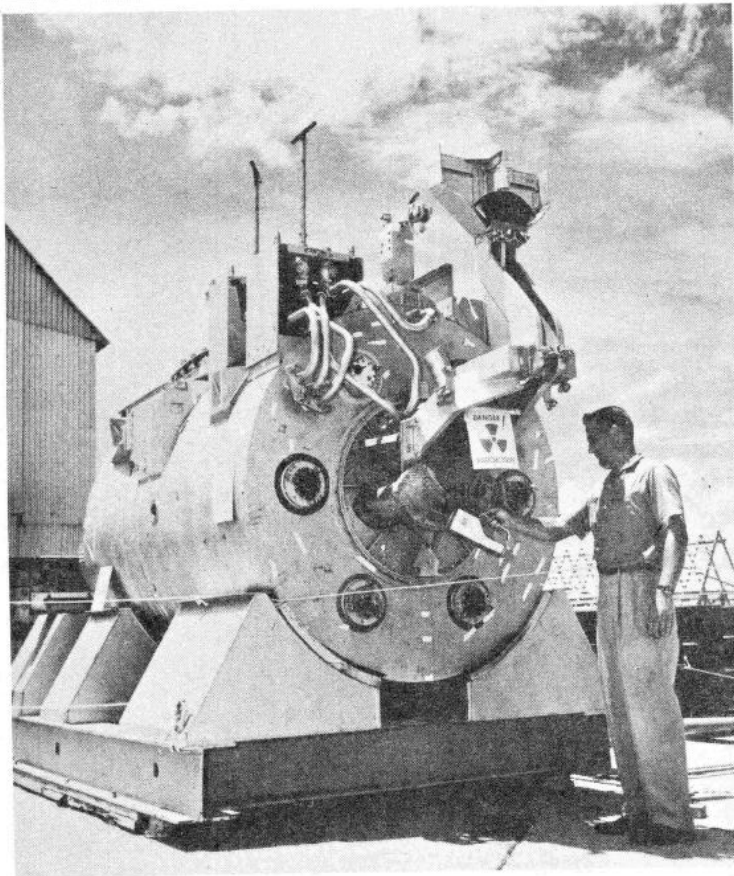




## PICTORIAL REVIEW



Above: Bell's 204B commercial copter carries 10 at 147 mph top, 260 miles. Military counterpart Army's HU-1 Iroquois set world records for speed, distance, and climb.



Opposite top: Navy's DASH (destroyer anti-sub helicopter) concept gets boost from success of Kaman HTK radio controlled, pilotless copters. Torpedo carrying proposal shown.

Left: First nuclear reactor carried aloft goes into retirement. Flown in modified B-36 to gather data on radiation and shielding; made 47 flights, first in 1955.

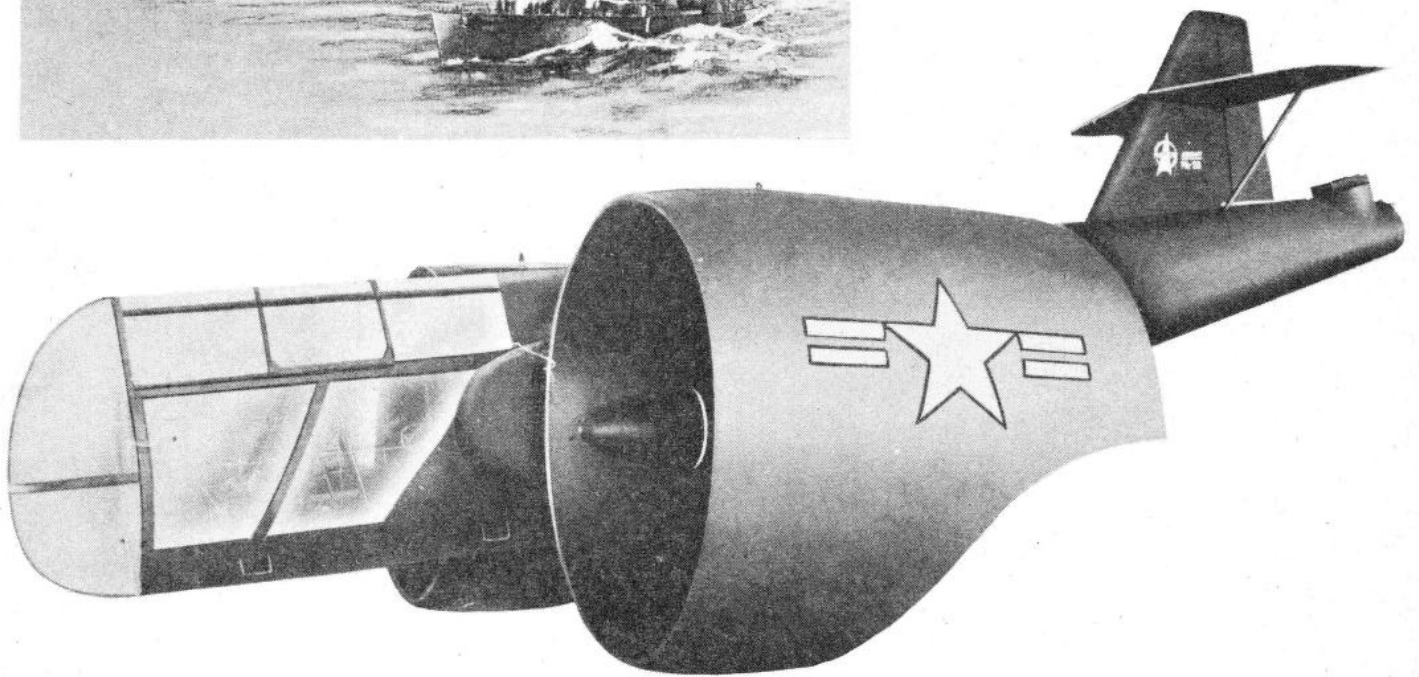
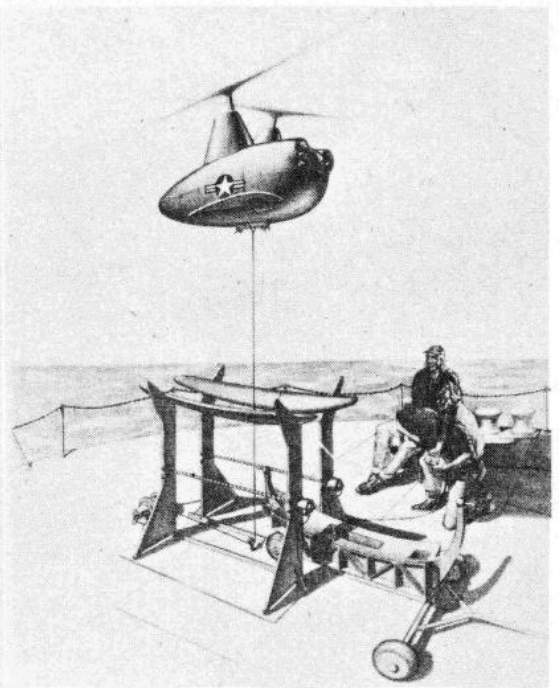
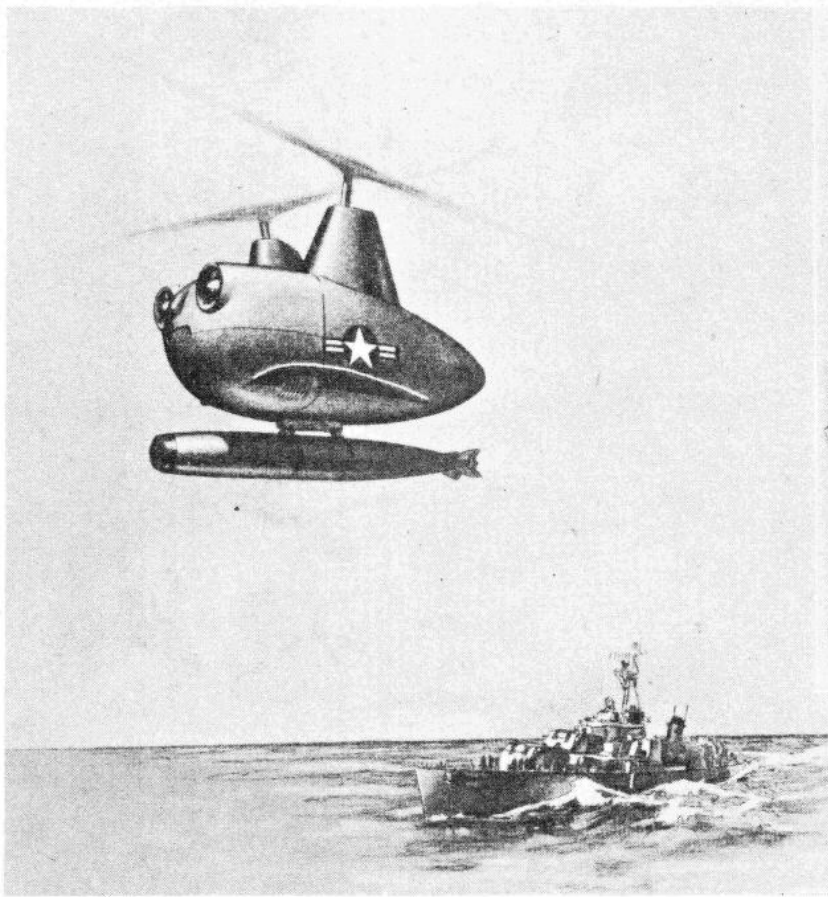
Opposite center: Piasecki Aircraft's mock-up of "Ring-Wing" VTOL/STOL craft. Annular wings serve as shrouds for props. Gases from turbine power exhaust through tail nozzles.

Opposite bottom: Britten-Normen Cushioncraft for travel over jungle roads, across rivers transporting bananas. Annular fan driven by sports car engine and wheel.

Below: CV-105 "Loadmaster" is Servicair's conversion of surplus Convair L-13. Power 450 hp P&W Wasp. Totes 1400-lb payload 600 miles, cruises 130 mph at 9000'.









***Military Service Ahead?... Special Report!***

SEPTEMBER 1956

35 CENTS

# Young Men®

THE MAGAZINE FOR TOMORROW'S TECHNICIANS AND ENGINEERS

**U. S. ARMY  
CAREER ISSUE**



**Air-Pix Roundup: Those Fabulous MINI-COPTERS**

**MODEL BUILDING HIGHLIGHTS** ● Walt Pyron's "Black Hawk" Stunter  
● D.C.-Powered "MG" For R/C Pulls "Battery Box" House Trailer  
● Secrets of Easy Covering by Harry Royse ● "USR-56" Training Plane

**Radio Control by Howard McEntee: "Mac-Junior" 27.255 MC**



# Young Men

SEPT., 1956 • VOL. 46, No. 6

EDITOR . . . . . ALBERT L. LEWIS, AMA #2

Technical Editor . . . . . Alex Dawydoff  
Art Director . . . . . Aubrey Kochman  
Career Editor . . . . . Carl Happel

Assistant to Editor . . . . . Rose Borello  
Art Assistant . . . . . Henry Hanson  
Editorial Assistant . . . . . Stephanie Notaro

Contributing Editors: Radio Control, Howard McEntee, W2SI; Scale Presentations, Walter M. Jefferies, Jr.; Books, William J. Lowry. Featured Contributors: Model Photography, John W. Schneider; Model Design, Frank Ehling; West Coast Modeling, Dick Everett; Model Boating, William A. Baughman; Air Adventurers Club, Russell W. Nichols; Sketchbook, Henry A. Thomas.

All Communications to the editors should be addressed:  
"YOUNG MEN," 304 East 45th St., New York 17, N. Y.

## IN THIS ISSUE

Kodachrome Cover: Howard Levy

|                                                     |    |
|-----------------------------------------------------|----|
| Power Dept. . . . .                                 | 6  |
| Air Adventurers Club . . . . .                      | 8  |
| Tech Guide—Career and School News 10                |    |
| The United States Army . . . . .                    | 13 |
| Technical Careers in the U.S. Army . . . . .        | 14 |
| By Bruce Jacobs                                     |    |
| United States Military Academy . . . . .            | 17 |
| They Made Army Their Career . . . . .               | 18 |
| Mac Junior 27.255 Transmitter . . . . .             | 20 |
| Black Hawk Stunter . . . . .                        | 22 |
| By Walt Pyron                                       |    |
| Those Fabulous Mini-Copters . . . . .               | 24 |
| By Howard Levy                                      |    |
| Young Men's World—Modeldom Reports 27               |    |
| Hobby Club Emblems—Cash Prizes . . . . .            | 28 |
| My Favorite Model—Cash Prizes . . . . .             | 28 |
| Hobbies-in-Action—Cash Prizes . . . . .             | 28 |
| 140-Mile Distance Soarer . . . . .                  | 29 |
| Money-Making Workshop Project . . . . .             | 29 |
| Contest Calendar . . . . .                          | 30 |
| What's Your Hobby?—Cash Prizes . . . . .            | 31 |
| Meet S. Paul Johnson . . . . .                      | 31 |
| Radio Control Fairchild PT-19 . . . . .             | 32 |
| By Chuck Hollinger                                  |    |
| USA-56 Training Plane . . . . .                     | 36 |
| By Paul Del Gatto                                   |    |
| Plane Modeling . . . . .                            | 42 |
| Model Boating . . . . .                             | 44 |
| Model Car News . . . . .                            | 48 |
| Radio Control . . . . .                             | 51 |
| The Model Technician . . . . .                      | 58 |
| Radio Controlled "MG" Pulls House Trailer . . . . . | 60 |

## C and Q

Your Comments and Queries are welcomed by the editors; shoot along those questions to 'em!

Substitute 18 for 10 . . . I'm looking for some down-to-earth suggestions on trouble-shooting model engines. Can you suggest anything along these lines?

Ed Friend, Saco, Maine

• Sure can, friend Friend. See "Twenty Reasons Why Your Engine Won't Start" in the August '56 issue of "Young Men." BUT MAKE THESE TWO CORRECTIONS TO THE CHECK LIST: Substitute the numbers 18 for 10 in the two spots shown below.

Satisfied Customer. As an officer currently on Active Duty, I certainly enjoyed your coverage of opportunities offered in the Air Force Career issue. This should aid in encouraging many young men to investigate the situation completely and give more serious thought to this branch of the Armed Forces.

1/Lt. Wilbur Blount, Holloman AFB, New Mex.

Schools for Diesel Technician . . . I want to take up diesel electrical technology. Please give me the names of two-year technical institutes that offer this course at the college level of training. Do any of them operate on the co-op plan—that is, arrange for you to alternate periods of study with equal periods of work at regular salary?

Gordon Hartzell, Brockway, Pa.

• The following technical institute type schools offer Automotive and Diesel Technology in the general field of Electrical Technology (those schools marked with an asterisk also give Steam and Diesel in the general field of Mechanical Technology):

1) Broome County Tech. Inst., Binghamton, N. Y. 2) Hudson Valley Tech. Inst., Troy, N. Y. 3) Long Island Agric. & Tech. Inst., Farmingdale, N. Y. 4) New Bedford Inst. of Textiles & Technol., Mass. 5) N. H. Tech. Inst., Portsmouth. 6) N. Y. State Agric. & Tech. Inst., Alfred. 7) N. Y. State Agric. & Tech. Inst., Canton. 8) N. Y. State Agric. & Tech. Inst., Morrisville. 9) N. Dak. State School of Sci., Wahpeton. 10) Oregon Tech. Inst., Oretch. 11) Multnomah College Tech. Div., Portland, Ore. 12) Spring Garden Inst., Philadelphia. 13) College of William & Mary Tech. Inst., Norfolk, Va. 14) \*Okla. A&M College—School of Tech. Training, Stillwater. 15) Southern Ill. Univ. Vocational-Tech. Inst., Carbondale. 16) W. Va. Inst. of Technol., Montgomery. 17) \*Franklin Tech. Inst., Boston. 18) \*LeTourneau Tech. Inst., Longview, Texas.

The following schools offer courses in Steam and Diesel only, as part of Mechanical Technology:

1) Wentworth Inst., Boston. 2) Univ. of Houston Tech. Inst.

The only two-year school with the co-op plan in automotive and diesel technology we know of is Broome County Technical Institute, Binghamton, N. Y.

Tenrai's Friend . . . In your 1953-54 "Air Progress" on page 74 appears a photo of the Japanese J5N1 (Tenrai). At its right is another plane's wing. It looks like an Me-262. If so, how did it get there?

Earl Donner, New London, Conn.

• Photo of J5N1 Tenrai was taken in the United States, we believe at Patuxent River, Md. Naval Air Station where a number of captured Japanese planes were on display. The jet in the background is not an Me-262, but a Japanese experimental plane called "Kikka." It was based on the Me-262 design, but scaled down from drawings shipped to Japan by Germany via submarine. The engines were small versions of the Jumo turbojet called Ne 20, rated power was 1,100 lbs. thrust each. They were installed in an airframe designed by the Japs. As far as we know, only two were built. One was wrecked during early test flights and the second captured by U.S. troops and shipped to United States.

One-Man Glider . . . I would appreciate it very much if you would send us information for obtaining plans for a one-man glider. We are willing to pay for suitable plans.

Ted Bara, Jr., Linden, N. J.

• We suggest you write to the Soaring Society of America, Box 71, Elmira, N. Y.

Finnish Air Force . . . I would like to know if Finland has any kind of air force and if so, has it any planes designed and built there?

Tom White, Elko, Nevada

• Yes, Finland has a small air force. Under the peace terms of World War II it is permitted to maintain an A. F. of 60 airplanes and a personnel strength of 3,000 officers and men. It cannot have any bombers and experiment with or build guided missiles. The Air Force consists of a number of Messerschmitt Me-109G fighters, some Douglas DC-3 transports, Focke-Wulf FW 44's, Vima and Ppy trainers. The last two aircraft are of Finnish design and construction.

As far as we know there are no plans or kits for Finnish planes available.

### SYMPTOMS

### CHECK IN ORDER

|                                                     |                          |
|-----------------------------------------------------|--------------------------|
| Won't fire . . . . .                                | 1, 2, 20, 3, 4, 8, 9, 19 |
| Fires each flip but does not keep running . . . . . | 3, 4, 12, 13             |
| Stops when battery is disconnected . . . . .        | 18                       |
| Runs out prime and stops . . . . .                  | 4, 5, 6, 16, 7, 17       |
| Does not run at steady speed . . . . .              | 13, 18, 11, 8, 9         |
| Runs steady but does not rev up . . . . .           | 14, 10, 8, 9, 11         |

## STREET & SMITH PUBLICATIONS, INC.

Our 101st Year—Established 1855

Arthur Z. Gray, President, Ralph B. Whittaker, Jr., Executive Vice-President, Arthur P. Lawler, Vice President and Secretary, Thomas H. Kaiser, Treasurer.

Advertising Director: Robert E. Park. Advertising Manager: Walter J. McBride, 575 Madison Ave., New York 22, N. Y. Midwest Advertising Manager: Frank C. Smith, 230 North Michigan Ave., Chicago 1, Ill. West Coast Advertising: Aaron D. Viller & Associates, 8217 Beverly Blvd., Los Angeles 48, Calif.

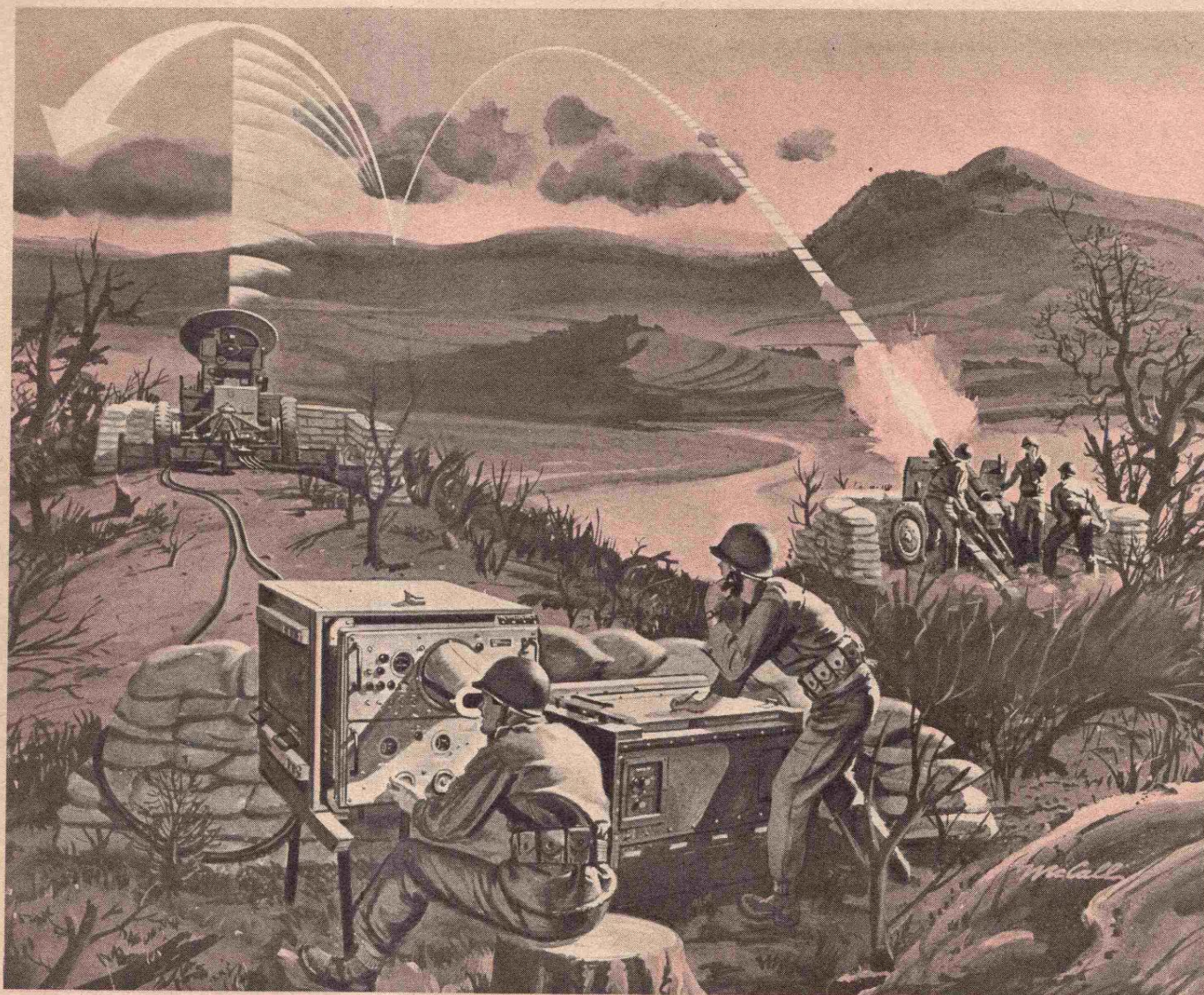
• Young Men is published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada, ©1956 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. 35c per copy. This issue is Vol. 46, No. 6.

• Please advise us if you move, giving old address and new address; allow four weeks for change of address; address subscription mail to Subscription Department, YOUNG MEN, 304 East 45th St., New York 17, N. Y.

• Subscription prices: U.S. and possessions — \$3.50 per year, \$6.00 for two years; Canada — \$3.50 per year, \$6.00 for two years; countries of the Pan American Union — \$7.00 per year, \$10.00 for two years. Elsewhere — \$10.00 per year, \$14.00 for two years.

• We cannot accept responsibility for unsolicited manuscripts or art work. All contributions must include return postage. The editors regret that because of the large number of entries they cannot enter into correspondence concerning any of YOUNG MEN'S design, photo or modeling competitions, nor can such entries be returned. Printed in U.S.A.





## HOW MANY MEN IN THIS PICTURE?

■ If you say "five" you'll be right — and wrong. For while there *are* three men in the gun crew and two manning the Army's new MPQ-10 Mortar Locator, there are many, many others in the picture. Among them are scores of Army men working hand-in-hand with the engineers of industries such as ours.

■ Development of the MPQ-10 is just one example. The result of the joint

efforts of the Army Signal Corps and Sperry engineers, this completely mobile unit utilizes radar to plot the course of an oncoming mortar shell, then traces the shell back to its point of origin. With the information it provides, the gun crew blasts the enemy battery out of existence — and fast. Result: Another American reason why *possible* aggressors today think twice before becoming *actual* aggressors.

■ When you join today's Army, you're "in the picture" more than ever before. Your opportunities are virtually unlimited, working with the most brilliant men in every field of science. You get training that helps you get ahead fast — training no amount of money could possibly buy. And you have the satisfaction of knowing you're doing a real job — for yourself and for your country, when you choose a military career.

**SPERRY**

**GYROSCOPE COMPANY**

Great Neck, New York

DIVISION OF SPERRY RAND CORPORATION



# The United States Army



GENERAL TAYLOR

“ . . . . The Army is an intimate part of America—founded in 1775, it is fourteen years older than the United States itself. It is our oldest military service, having fought all of America’s wars in defense of this nation.

“ . . . . This is no longer the Army of just riflemen, clerks, cooks, cannoneers, and the like. The artillery gunner of World War II, while he might have served any one of several weapons, must now specialize to serve the 280-mm atomic cannon, the Honest John rocket, the Nike and Corporal guided missiles, or any one of several other types of artillery.

“ . . . . The Army is one of the biggest business enterprises in the world, having capital assets in real estate, supplies, equipment, and various holdings to the value of over 52 billion dollars. The hardware which represents the equipment and supplies in the hands of our troops and in our depots amounts to about 25 billion dollars, and we have the problem of obsolescence of material at an annual rate of over a billion dollars. In terms of personnel, the Army has on its payroll over one million soldiers and around 430,000 civilians. It is a global Army, scattered in bases about the world with some 40 percent of it serving overseas in 73 countries.

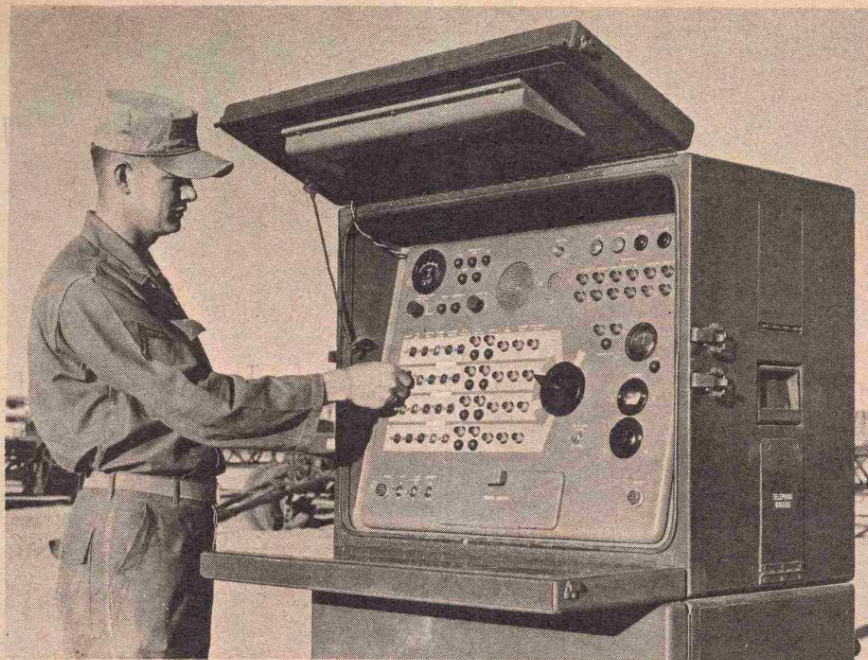
“ . . . . The more the Army reflects upon its role in the future with its requirement to resist aggression promptly at any place, at any time, we are impressed with the need for greater strategic mobility.

“ . . . . The Army will carry to the battlefield of the future destructive power vastly in excess of anything that has ever been imagined in the past. By possessing both conventional and nuclear weapons, the Army can adjust the power of its blows to the situation at hand. I feel that there is great military significance in the fact that the Army has weapons which vary from the MP’s pistol to the kiloton yield of heavy atomic weapons. This gradation in the effect of our weapons gives a great flexibility in the application of the military power of which the Army disposes.



Excerpts from speeches by  
General Maxwell D. Taylor  
Chief of Staff, United States Army





One of the men and one of the machines behind the missile. Center photo shows

the powerful Redstone ballistic missile being fueled, checked at Patrick AFB.

■ Jukeboxes around the country have been playing a swing arrangement of an old army marching song about "The Dogface Soldier" who calls himself "the walking pride of Uncle Sam."

Today's Army, however, is manned not only by "dogface soldiers" of the infantry and other combat arms but also by a corps of highly trained specialists and technicians who are needed to maintain and operate the complicated machinery of a modern military force.

The "Dogface Soldier" of the modern Army has got to do far more than march with a rifle on his shoulder. And behind each combat soldier there must be ten trained as technicians and specialists.

Our Army is roughly divided into three segments—the arms, services, and special branches.

The arms are Infantry, Armor, Artillery, Corps of Engineers, Signal Corps.

The services include the Adjutant General's Corps, Chemical Corps, Finance Corps, Military Police Corps, Ordnance Corps, Quartermaster Corps, and Transportation Corps.

The special branches are the Medical Corps, Mental Corps, Veterinary Corps, Medical Service Corps, Judge Advocate General's Corps, and Chaplains.

And there is the newest career field—Army Aviation.

The Army is a pretty vast establishment (with just over a million men on active duty at the present time) and so it would be sheer nonsense to pretend that every soldier gets the assignment he wants or the job for which he feels he is best qualified. Assignments are pretty much a matter of what the Army's requirements happen to be *plus* a careful analysis of each individual's background and his latent capabilities based upon aptitude tests.

#### Career Fields for Direct Enlistment

Under certain conditions it is frequently possible for a man who signs up for a three or four year hitch to enlist for a specific assignment. It is important to remember that each field has a limited quota. Usually the recruiting specialist in

your home town knows, or can find out, whether there are openings at the time you are about to begin *your* Army career.

These are the career fields in which direct enlistments were possible at the time this report was completed:

1. Branch of Service. Generally speaking a man who enlists for three years or more is privileged to pick his branch of service—*i.e.*, infantry, artillery, signal corps.

2. Army Disciplinary Barracks. These assignments are controlled by the Military Police Corps. Openings are for men who are trained as, or who have qualifications to become, specialists in the field of penology.

3. Overseas Commands. To a limited degree new recruits can sometimes enlist directly for specific overseas assignment. No one is actually permitted to ship out until he has completed basic training. New entrants into the Army may, at this time, sign up for our "frontier-guard" forces in Korea. This calls for a 16-month tour of duty in war-torn Korea, the remainder of the enlistment to be spent in the United States.

4. Gyroscope Units. When the Department of Army designates an outfit as a "Gyro" unit it is permitted to accept direct enlistment of men who will train with the unit and accompany it overseas and, if possible, remain with it when it is ordered back to the U.S.

5. Army Security Agency, and

6. Counter Intelligence Corps. Both of these involve investigative and sometimes undercover work. There are tight quotas based upon current need and the individual's qualification. Both of these agencies seek men with college degrees.

7. The Army Band. Besides the U.S. Army Band and the U.S. Army Field Band, both stationed in Washington, there are numerous other openings for military bandmen. To become a member of an Army band a musician must be fully trained prior to enlistment. Applicants are generally auditioned at an Army post near their home. Many Army bandmen receive additional training at the U.S. Naval School of Music. Washington, D.C.

# Technical Careers in the U.S. Army

Mobility, missiles and highly trained technicians make up America's modern Army. More than ever before this branch offers a fascinating career to mechanically-minded young men.

By BRUCE JACOBS



8. Antiaircraft Artillery. This involves, principally, enlistment for training and subsequent assignment as a member of a NIKE crew. This means being stationed in one of the many gun sites located around key cities and industrial centers.

9. Special Forces. The Army's toughest fighting men who can fight anywhere at any time, the Special Forces are both rangers and paratroopers. Their headquarters are at Fort Bragg, North Carolina.

10. The High School (Army Technical School) Program. Here is a way for high school men to make specific plans for an Army career as a specialist even before they take the oath of enlistment.

### Army Life

No one with any good sense has ever tried to peddle the line that a soldier is pampered and that his life is a bed of roses. Soldiering is distinctly a man-sized job. And because a military man relinquishes certain things when he joins the service, the government reciprocates in certain ways.

Thus, you find that the soldier gets free medical and dental care. He is authorized to shop at a Post Exchange and a Commissary where prices are generally lower than on the outside. He pays an income tax only on his base pay (the money he receives for quarters and food allowances are not taxed). He can bank his money in Soldiers' Deposits which pays 4% interest.

Every man receives, without cost, a \$10,000 life insurance policy. When he moves from one post to another his dependents receive travel allowances. He is the recipient of a fairly generous scale of reenlistment bonuses and he may obtain a government-guaranteed loan if he wishes to purchase a home. He is the beneficiary of a retirement plan that would cost the average civilian \$100,000. A Master Sergeant who retires after 30 years (regardless of age) gets \$251.55 a month for life.

You *must* be a high school graduate to qualify for most of the Army Technical Schools and for Officer Candidate School.

A word about the unusual aspects of the High School Program which was mentioned briefly a few paragraphs back. This program has come about because it is urgent for the Army to train young men in a wide variety of exciting fields ranging from atomics to heavy construction.

This program should be of special interest to the readers of *Young Men*. To begin with the applicant must be a high

school graduate. From either the high school counselor or an Army recruiting specialist it is a simple matter to obtain booklets which describe the program in detail.

From a long list (of far more than 100 categories) select the career specialist field which is of interest to you. Send a letter of application for the course of your choice, along with a letter from your high school principal or some other civil leader (plus a transcript of your high school record) to The Adjutant General, Department of the Army, Washington 25, D.C. Attention: AGSN-P.

The Army gives these applications top priority and you should have an answer within 15 days. If you have met with the high standards required for enrollment in the program you will receive a letter stating that a school vacancy has been reserved for you. It is then up to you to enlist in the Army and prepare yourself for attendance at the school following the completion of basic training.

There's a wide range of Army careers open through this training program. The general scope includes combat, electronics, electrical maintenance, precision maintenance, military crafts, motor maintenance, and special assignments. Alphabetically these jobs range from Artillery Ballistics Meteorology to Structural Steel Working. There are courses for Atomic Weapons Assembly Specialists, Electronic Counter-measure Operators, Guided Missile Electronics men.

There are openings for helicopter repair men, soldiers who must be able to do cable-splicing, telephone installation and repair; who can keep records, who are expert at canvas and leather repair; who can maintain office machinery, who can cook and bake, who are qualified as harbor divers, marine hull repairmen, crane shovel operators; who can work as railway trainmen, as cryptographers, teletype operators, as public information specialists, as motion picture or still camera photographers—to mention only a scant few.

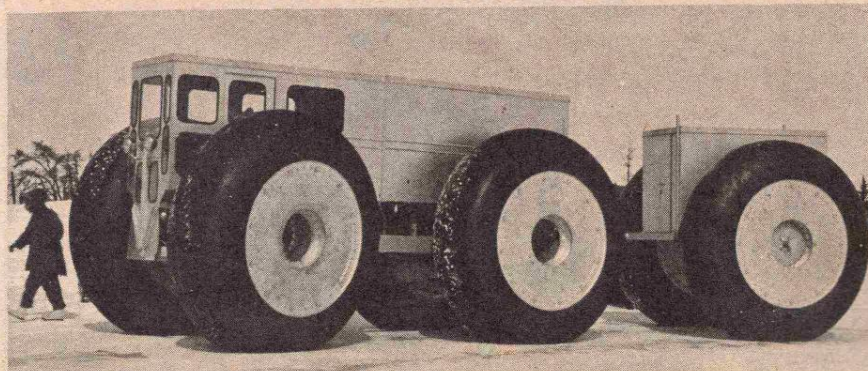
### Every Man a Soldier

Everyone starts his Army career with Basic Training. And the first eight weeks of basic are the same whether you are going to be an electronics expert, a precision maintenance technician or—a "Dogface Soldier" of the line.

The conclusion of the first eight weeks of basic training marks the point at which the specialists and line soldiers go in slightly different directions. It is at this time, as soldiers who are to be

Quest for mobility in all climes of the world produced this Marsh Buggy which

carries 20. Does 6 knots in water, up to 30 mph in swamps and deep mire. 10' tires.





assigned to the arms head into advanced individual training, that the future specialist is sent off to school. Many of the infantrymen, artillerymen and others in the combat arms undergo special schooling after they finish advanced individual training.

### What Kind of Men?

There is an ever-increasing need for a steady flow of high-caliber soldiers into the combat arms as well as the technical services; warfare today requires the employment of weapons and vehicles far beyond anything that was envisioned 40 years ago when General John J. Pershing of the A.E.F. in France declared, "Send me men who can shoot and salute."

An infantry soldier must master not only his own M-1 rifle (which may soon be replaced by a fully automatic, lightweight rifle that will fire the most powerful small arms cartridge ever devised) but he must also be proficient in the handling of recoilless rifles that are as potent as World War II artillery; he must be skillful in the use of high-powered rockets that can stop an enemy tank in its tracks; he must be prepared to hurl "killer" grenades that pack an unbelievable lethal wallop.

The artilleryman is no longer just a brawny fellow who wrestles an artillery shell into the breach of a gun and waits while another man yanks the lanyard. The artilleryman of today must deal with astounding new rockets and missiles.

Through its development of cargo and troop-carrying helicopters the Army is looking toward the day when its "Sky-cav" (highly mobile, hard-hitting, fast-

moving, air-transported reconnaissance forces) will be able to penetrate deep into an enemy's own rear area.

So, you see, the old "Dogface Soldier" is still a very important figure, even in this modern era.

He fights on foot—sure—but he trains to race toward his objective by helicopter or across land surfaces in swift new armored infantry carriers. He dismounts to fight clad in lightweight combat body armor—a development that stems from our success with armor vests in Korea. Strapped to each man's combat pack is a remarkable protective mask designed to resist the onslaughts of CBR (chemical, biological, radiological) warfare.

His arsenal includes "The BAT"—a high-powered anti-tank rifle which is mounted on a jeep said to be capable of piercing the stoutest armor in existence today. He is backed up by the latest in field artillery—self-propelled guns which resemble tanks, by "Honest John" and the "Corporal," principal items in our "rocket artillery" treasure chest.

The former is a close-support, medium-range weapon and artillerymen say that one "Honest John" rocket packs a punch equal to 100 rounds of conventional howitzer fire. The "Honest John" is a free-flight projectile in that its course cannot be altered once it has been sent winging toward a target.

The "Corporal," on the other hand, is an electronically controlled missile capable of changing its direction in flight. It has greater range than "Honest John" and packs a fearful punch in a warhead that may be atomic or conventional high explosive.

### NEXT ISSUE: ARMY AVIATION



Model of 4-man Hiller flying platform. Next month see the special article on the Army's "new wings."

### Our Large Standing Army

Ours today is the largest standing Army that the United States has ever had in time of peace. This is but a reflection of the critical era in which we live. This large and complex Army is on the job both at home and abroad.

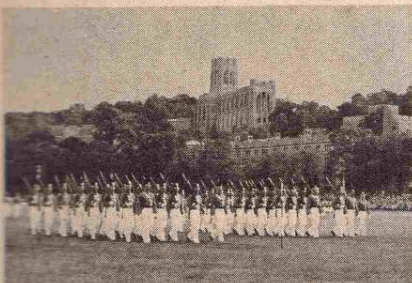
In contrast to the days before Pearl Harbor when "foreign service" meant Alaska, Hawaii, the Philippines or the Panama Canal Zone, the Army today carries out its missions in 73 countries—from Alaska to Thailand. We have military missions and advisory groups in the

(Continued from Page 65)

## MEN AND MACHINES OF THE MODERN UNITED STATES ARMY







Review of West Point Corps of Cadets.



Engineering training at Camp Buckner.



Armored training for 3rd Class cadets.

# United States Military Academy

**What is It?** The United States Military Academy is the senior service academy. Its student body is designated the United States Corps of Cadets. Its purpose is to provide trained career officers for the United States Army.

**Historical Background:** Heavily fortified West Point first became important because of its tactical value during the Revolutionary War. It was nearly betrayed to the British by Benedict Arnold. General George Washington, a strong advocate of a national military school, recommended West Point as the site in a letter written two days before his death. The Academy opened its doors on July 4, 1802, with 10 cadets.

Under its fifth superintendent, Major Sylvanus Thayer, Corps of Engineers, the Academy came into its own as a leading educational institution. Thayer was on duty at West Point from 1817 to 1833. Many of his students distinguished themselves in the War with Mexico. Graduates U.S. Grant and Robert E. Lee were the principal commanders for North and South in the Civil War. Current authorized strength of the Corps of Cadets totals 2,496.

**Location:** West Point, N.Y. is situated in the Hudson Valley about 50 miles north of New York City, on the west bank of the Hudson River.

**Primary Qualifications:** An ancient Academy regulation states that a Cadet may have "no beard, no wife, no horse." There are more stringent entrance requirements today. To be eligible for enrollment the prospective cadet must be at least 17 (by July 1 of year of admission), must be able to pass the physical examination required for appointment as an Army officer, and must be a citizen of the United States.

**Educational Qualifications:** Most new cadets enter West Point directly from high school or prep school. Young men who have made good grades in mathematics and English can generally do well in competitive entrance examinations without cramming. Every candidate must submit a transcript of his complete educational record. Satisfactory grades in at least 15 units of credit are mandatory.

**Entrance Examinations:** Basically, every candidate must take a certain standard College Entrance Examination—but the specific tests depend upon a number of factors. For example, whether the candidate hopes to obtain admission via the competitive or non-competitive route; whether or not the candidate has completed any college studies. Information as to the particular College Board tests may be obtained from the Registrar, U.S. Military Academy, West Point, New York.

**How to Apply:** The first step is to submit a letter to your U.S. Senators and the U.S. Representatives. The congressmen from your home state are entitled to name four candidates for each vacancy that exists from his state. One is a "principal," the others are alternates. These nominations (accounting for 85% of the Corps), are entirely up to the congressmen. Some lawmakers hold preliminary competitive examinations to select nominees.

Appointments are also made by the President (who may nominate the sons of present, retired, or deceased members of the regular forces). Application for Presidential appointments is made by writing a letter with full particulars to the Adjutant General, Department of the Army, Washington 25, D.C., AATN: AGPB-M.

Forty cadetships are provided for the sons of members of the Armed Forces who were killed in action (or died as a result of war wounds) in World War I or II, or in Korea. Full details are available by writing to address above.

Another 40 openings are reserved for graduates of Honor Military and Honor Naval schools.

Sons of men who were awarded the Medal of Honor may be appointed upon their application provided that they meet all qualifications. Letters of application (no standard form necessary) should be submitted to The Adjutant General.

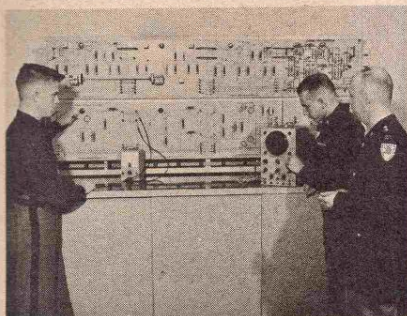
The 180 cadetships from the enlisted men of the Army take 90 from the Regular Army; 90 from the reserves (Army Reserve and National Guard). Applicants must have completed at least one year of duty. For Army men and reservists details are in Army Regulation 350-90-2.

**Program of Instruction:** Cadets receive 4 years of undergraduate instruction leading to the award of a degree of Bachelor of Science. All graduates, except foreign cadets and those unable to pass the final physical, are commissioned Second Lieutenants in the United States Army.

**Pay and Allowances:** No cadet pays tuition or any other charges. As a member of the regular army establishment he receives \$111.15 a month; out of this he pays for uniforms, text books, and personal effects. Each cadet also receives a ration allowance which covers cost of meals.

**NOTE:** Following publications may be obtained by writing to The Registrar, U.S. Military Academy, West Point, New York: Catalogue of the U.S. Military Academy, 1956-57; Building Leaders—The Story of West Point.

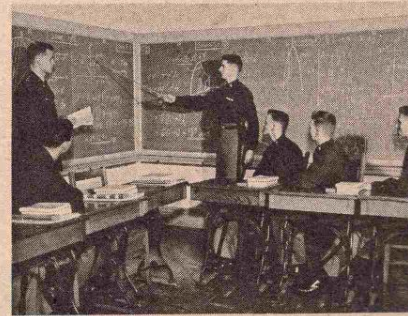
Students get radio-electronics subjects.



Mascot mules "Hannibal," "Pancho."



Math and more math is order of the day.





**Military  
Service Ahead?**

JUNE 1956 • 35 CENTS

**SPECIAL REPORT FOR TEEN-AGERS!  
U.S. AIR FORCE CAREER ISSUE**

# Young Men®

**For Beginning  
Audiophiles:  
HOW LOW HI-FI?**

**Young Sportsmen: Your Best Fishing Outfit  
Build and Fly Lockheed C-130 Control Model**

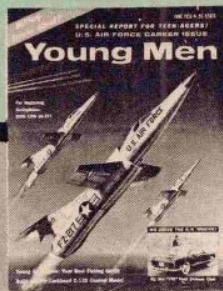
**WE DRIVE THE G-K 'WAGON!**



**By the "YM" Test Drivers Club**



# Young Men



JUNE, 1956 • VOL. 46, No. 3

Those F-Whatzit's on the cover were drawn by James M. Triggs, better known as "Supersonic Jim, the lightning artist." Configuration is by our first-place \$50 winner in this month's "Designs of Tomorrow" competition.

If you're interested in joining the Civil Air Patrol and can't locate your nearest squadron, write to this magazine and we'll send you the location of your state wing commander.

If your class or club would like to visit an Air Force base, have your teacher or advisor write to the "Information Services Officer" at that airfield. He can also supply you with booklet "Information Bulletin on USAF Academy" (also for that try your public library).

Obviously, the variety of jobs open to you in the Air Force cannot all be covered in one issue of any magazine. But the A.F. has a small booklet, a "Pocket Guide to Air Force Opportunities," which describes the training and progress of an airman from enlistment through basic and technical training and assignment to an A.F. job. It tells about more than 100 training courses (from Accounting Specialist to Woodworking), gives you a glimpse of life on an Air Force Base, and explains how you can continue your education while you're in the service.

Every Air Force recruiting station has this guide, or you can get one by writing to *Young Men*, 304 E. 45th St., New York 17, N. Y., and asking for a copy of "PGTAFO." Be sure to include your name and home address.

## STREET & SMITH PUBLICATIONS, INC.

Our 101st Year—Established 1855

Arthur Z. Gray, President, Ralph R. Whitaker, Jr., Executive Vice-President, Arthur P. Lawler, Vice President and Secretary, Thomas H. Kaiser, Treasurer.

Advertising Director: Robert E. Park. Advertising Manager: Walter J. McBride, 575 Madison Ave., New York 22, N. Y. Midwest Advertising Manager: Frank C. Smith, 230 North Michigan Ave., Chicago 1, Ill. West Coast Advertising: Aaron D. Viller & Associates, 8217 Beverly Blvd., Los Angeles 48, Calif.

EDITOR . . . . . ALBERT L. LEWIS

Technical Editor . . . . . Alex Dawydoff  
Art Director . . . . . Aubrey Kochman  
Career Editor . . . . . Carl Hoppel

Assistant to Editor . . . . . Rose Borello  
Art Assistant . . . . . Henry Harson  
Editorial Assistant . . . . . Stephanie Notaro

Contributing Editors: Radio & Radio Control Models, Howard McEntee; Scale Presentations, Walter M. Jefferies, Jr.; Books, William J. Lowry; Outdoor Sports, Vlad Evanoff; Weapons, James M. Triggs; YM Test Drivers Club, Joe H. Wherry.

All Communications to the editors should be addressed:  
"YOUNG MEN," 304 East 45th St., New York 17, N. Y.

## IN THIS ISSUE

|                                                           |    |
|-----------------------------------------------------------|----|
| Queries and Comments from Readers                         | 6  |
| Scholarship-Career-School Guide                           | 8  |
| Designs of Tomorrow—Cash Prizes                           | 10 |
| Young Sports-Men—Conducted by Vlad Evanoff                | 12 |
| Tech Topics                                               | 14 |
| The Air Force as a Career                                 | 17 |
| Gen. Nathan F. Twining, Chief of Staff, USAF              |    |
| U.S. Air Force: Your Career?—Allan R. Scholin             | 18 |
| United States Air Force Academy                           | 23 |
| Teen-age Jet Jockeys                                      | 24 |
| Cadel Capt. A. H. Schwartz, CAP, with Frank Burnham       |    |
| U.S. Jet Air Force—Scaleviews by Walter M. Jefferies, Jr. | 26 |
| They Made Air Force Their Career                          | 28 |
| See For Yourself—Tours of Air Force Bases                 | 30 |
| "My Favorite Photo"—Cash Prizes                           | 31 |
| Spectacular "Hercules" Model—Henry G. Edwards             | 32 |
| We Drive the Ghia-Karmann Volkswagen                      | 36 |
| "YM" Test Drivers Club with Joe Wherry                    |    |
| Young Men's World—Reports, Info, Contests                 | 38 |
| Young Man of the Month                                    | 38 |
| "Strictly Personal"—William W. Rose, Jr.                  | 39 |
| "My Favorite Model"—Cash Prizes                           | 40 |
| What's Your Hobby?—Cash Prizes                            | 41 |
| Hobbies-in-Action—Cash Prizes                             | 41 |
| Realism-in-Models—Cash Prizes                             | 44 |
| How Low Hi-Fi?—Howard G. McEntee                          | 44 |
| Club Emblems—Cash Prizes                                  | 45 |
| What Are the Most Popular Shotguns and Rifles?            | 48 |
| William J. "Billjay" Stevens                              |    |
| F.Y.I.—Catalogs and Booklets to Get                       | 49 |
| Radio Control—Conducted by Howard G. McEntee              | 51 |
| Tone Aerotrol Transmitter and Receiver                    | 56 |
| Model Boating                                             | 58 |
| Model Car News                                            | 62 |
| Sketchbook—Drawings by H. A. Thomas                       | 64 |
| Showcase                                                  | 70 |
| Blue Ribbon Kit Models                                    | 74 |
| Advertisers' Index                                        | 81 |

● *Young Men* is published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. ©1956 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. 35c per copy. This issue is Vol. 46, No. 3.

● Please advise us if you move, giving old address and new address; allow four weeks for change of address; address subscription mail to Subscription Department, *YOUNG MEN*, 304 East 45th St., New York 17, N. Y.

● Subscription prices: U.S. and possessions — \$3.50 per year, \$6.00 for two years; Canada — \$3.50 per year, \$6.00 for two years; countries of the Pan American Union — \$7.00 per year, \$10.00 for two years. Elsewhere — \$10.00 per year, \$14.00 for two years.

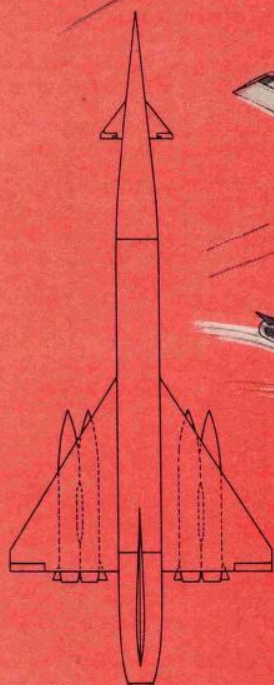
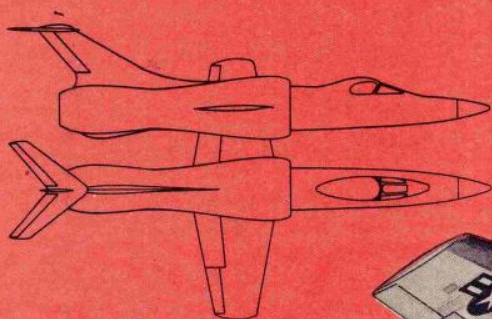
● We cannot accept responsibility for unsolicited manuscripts or art work. All contributions must include return postage. The editors regret that because of the large number of entries they cannot enter into correspondence concerning any of *YOUNG MEN'S* design, photo or modeling competitions, nor can such entries be returned. Printed in U.S.A.





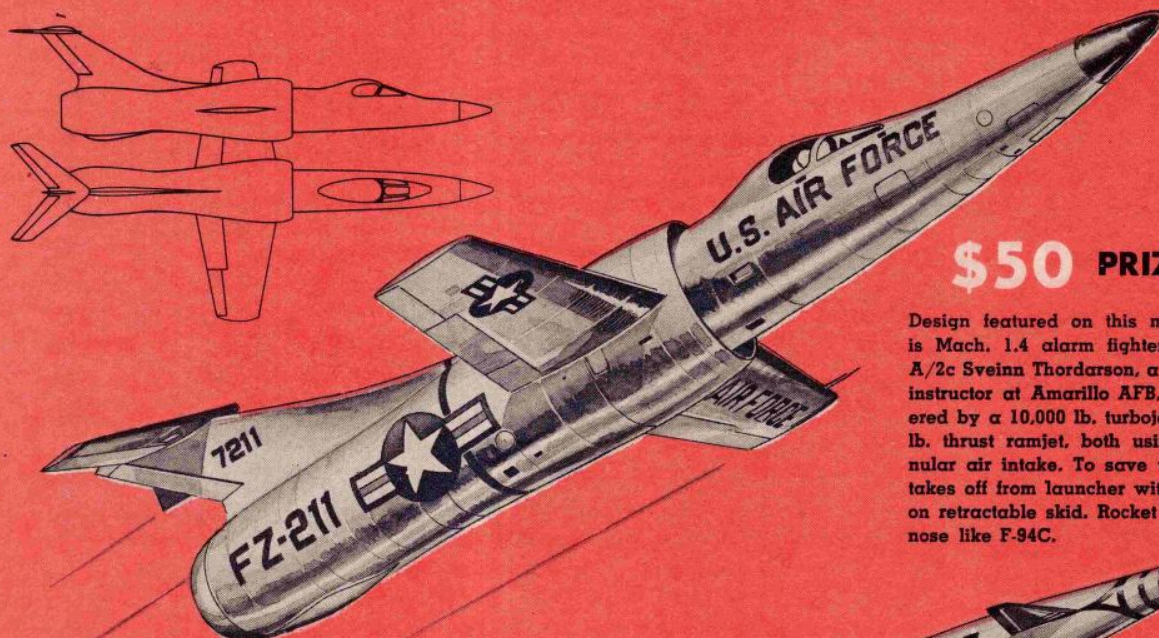
# DESIGNS OF TOMORROW

BY YOUNG MEN READERS



## \$50 PRIZE AWARD

Long-range fighter escort by Wayne Johnson, 1764 West Rose St., Stockton, Calif. Powered by two turbojets of 10,000 lbs. thrust each, plus afterburners. Armed with six 20-mm cannon in nose, has electronic search & aiming equipment. Span is 38 ft.



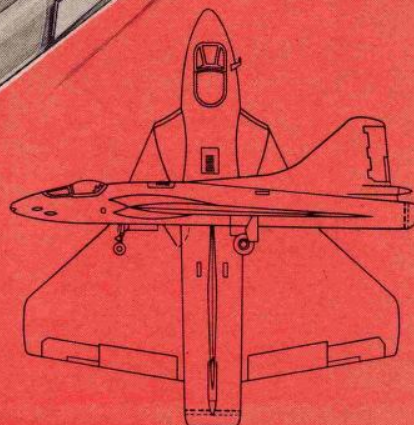
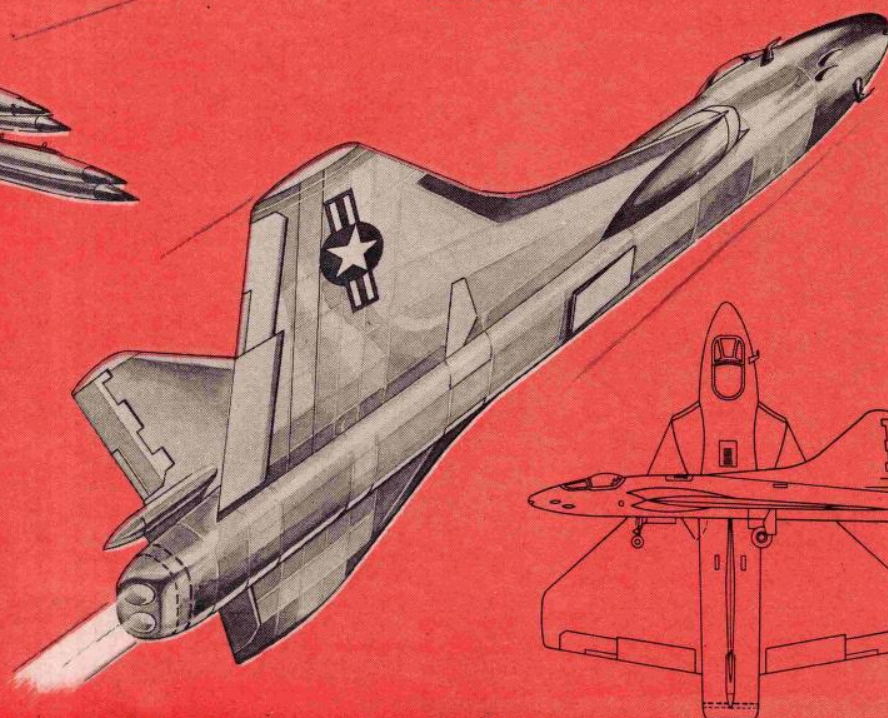
## \$50 PRIZE AWARD

Design featured on this month's cover is Mach. 1.4 alarm fighter by USAF's A/2c Sveinn Thordarson, a jet mechanic instructor at Amarillo AFB, Texas. Powered by a 10,000 lb. turbojet and 20,000 lb. thrust ramjet, both using same annular air intake. To save weight plane takes off from launcher with Jato, lands on retractable skid. Rocket armament in nose like F-94C.



## \$50 PRIZE AWARD

Intercontinental Bombardment Missile by Dale E. Knutsen, 325 Townsend Lane, Santa Maria, Calif. Powered by 60,000 lb. thrust rocket and four jettisonable boosters of 8,000 lbs. thrust each. Takes off from rocket sled launcher. Speed Mach 13, ceiling 500,000 ft.





Dale Johnston  
11690 S.E. Clover Lane  
Portland 66, Ore.

Three awards of \$50 apiece and 12 awards of \$10 apiece every issue will be made for the most significant entries submitted to this magazine for the "Designs of Tomorrow" competition. Entries may be concerned with any type of vehicle for land, sea or air transportation, for commercial or private use, structures such as houses, buildings, bridges, roadways or terminals, labor-saving equipment or gadgets—anything that has a scientific, mechanical or technical place in the world of tomorrow. Entries should be sent to "Designs of Tomorrow," c/o Young Men Magazine, 304 East 45th Street, New York 17, N. Y. Because of the large number of entries, the editors cannot accept correspondence concerning winning submissions, nor will any be returned. Those entries which the editors consider most significant will be selected for presentation here; winners will be selected by the editors, whose judgment is final.



Embry-Riddle's Placement Service and an alumni of over 50,000 men will open doors to give you a quick start—and professional recognition. Study and play in Miami's perfect year-round climate is stimulating and exciting. Mail coupon right now for full information.

I am a (check one) ☐ veteran ☐ non-veteran

- ☐ Aeronautical Engineering Design
- ☐ Aviation Administration
- ☐ Business-Pilot
- ☐ Private Pilot
- ☐ A&E Mechanic
- ☐ A&E combined with Private Pilot
- ☐ Commercial Pilot
- ☐ Instrument Rating
- ☐ A&E combined with Commercial Pilot
- ☐ Electronics

AMERICA'S HOBBY CENTER SALUTES THE  
★★★ U.S.A.F. ★★★



**PGS. 55-56-57**

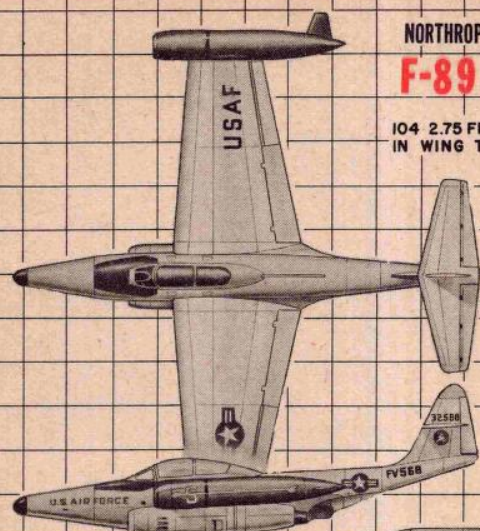
**AHC... WORLD'S LARGEST HOBBY MAIL ORDER HOUSE**



# U.S. JET AIR FORCE

SCALEVIEWS By WALTER M. JEFFERIES, Jr.

CONVAIR

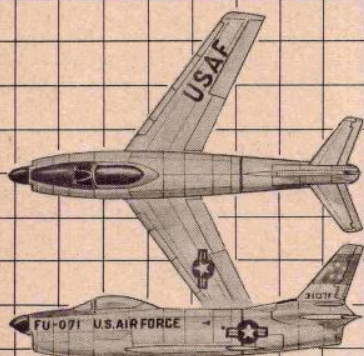


**NORTHROP  
F-89D**

104 2.75 FFAR ROCKETS  
IN WING TIP PODS

2 J-35-A-35 & SOLAR AFTER-  
BURNERS 7,500 lb./thr.

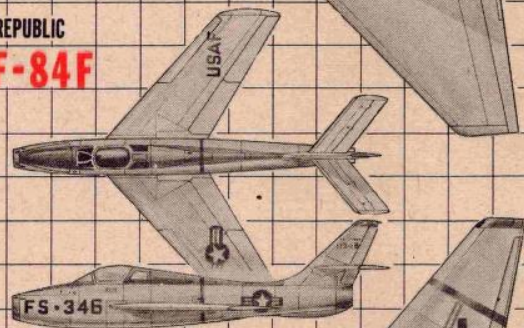
**BOEING  
B-52D**



**F-86D  
NORTH AMERICAN**

J-47-GE-33 7,600lb./thr.  
WITH AFTERBURNER  
OTHER VARIANTS OF F-86  
ALSO IN SERVICE

**REPUBLIC  
F-84F**

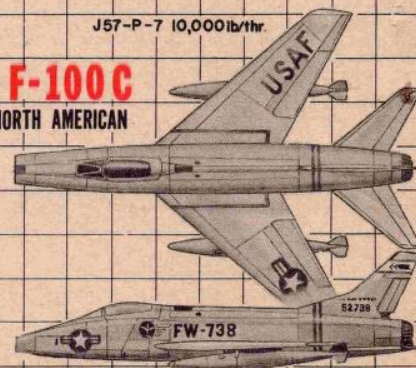


J-65-W-3  
7,200 lb./thr.

F-100C 822.135mph.  
WORLD'S SPEED RECORD  
COL. H.A. HANES - 1955  
THOMPSON TROPHY.

J-57-P-7 10,000lb./thr.

**F-100C  
NORTH AMERICAN**



MARKINGS SHOWN ARE OF THE  
479th FIGHTER DAY WING.

LATEST A.F. MARKINGS MOVE  
STANDARD U.S. INSIGNIA AFT-  
JUST AHEAD OF RED DANGER  
BANDS. 'U.S. AIR FORCE' FOR-  
WARD OF WING, ON NOSE

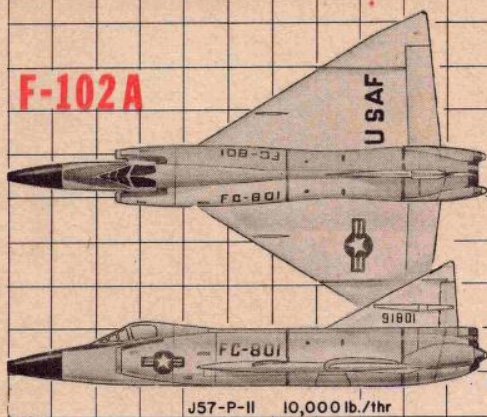
BLUE NOSE BAND AND CREST OF  
STRATEGIC AIR COMMAND.

NO. 5049 - FIRST B-52 OUT OF  
BOEING WICHITA PLANT.

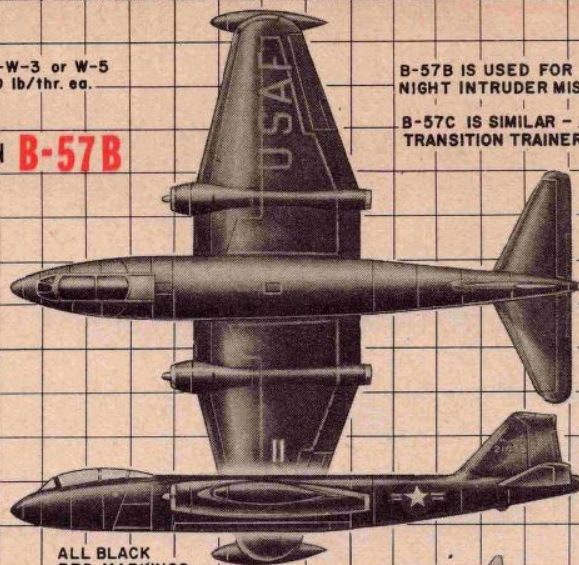
8 J-57-P-1 10,000 lb./thr. ea.

EACH SQUARE = 5 FEET

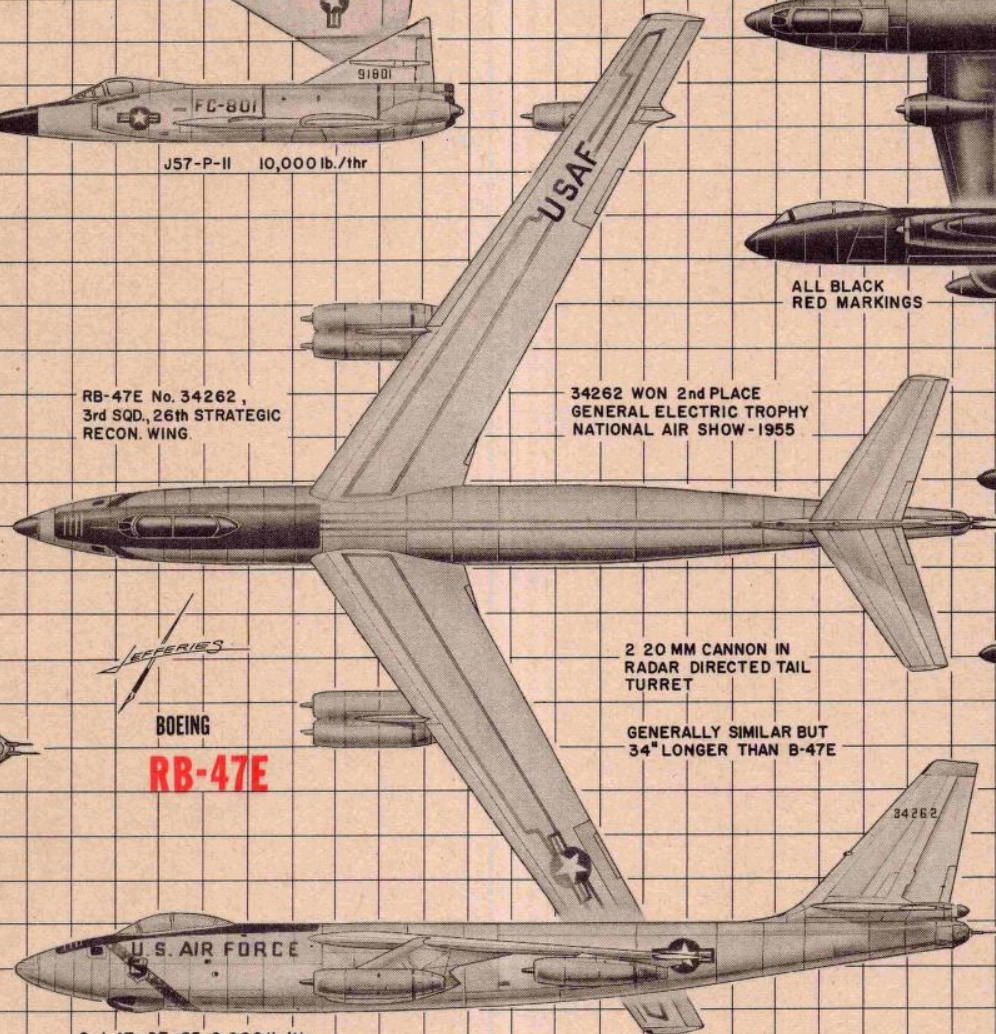


**F-102A**

J57-P-11 10,000 lb./thr

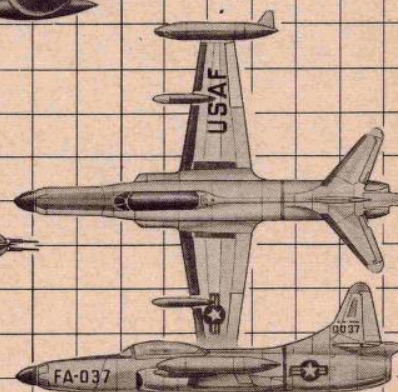
2 J65-W-3 or W-5  
7,500 lb./thr. ea.**MARTIN B-57B**B-57B IS USED FOR  
NIGHT INTRUDER MISSIONS.B-57C IS SIMILAR -  
TRANSITION TRAINER.ALL BLACK  
RED MARKINGSRB-47E No. 34262,  
3rd SQD., 26th STRATEGIC  
RECON. WING.34262 WON 2nd PLACE  
GENERAL ELECTRIC TROPHY  
NATIONAL AIR SHOW-19552 20 MM CANNON IN  
RADAR DIRECTED TAIL  
TURRETGENERALLY SIMILAR BUT  
34" LONGER THAN B-47E

BOEING

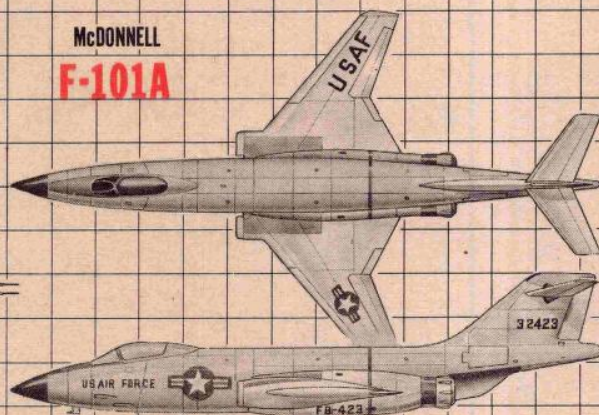
**RB-47E**

6 J 47-GE-25 6,000 lb./thr.

LOCKHEED

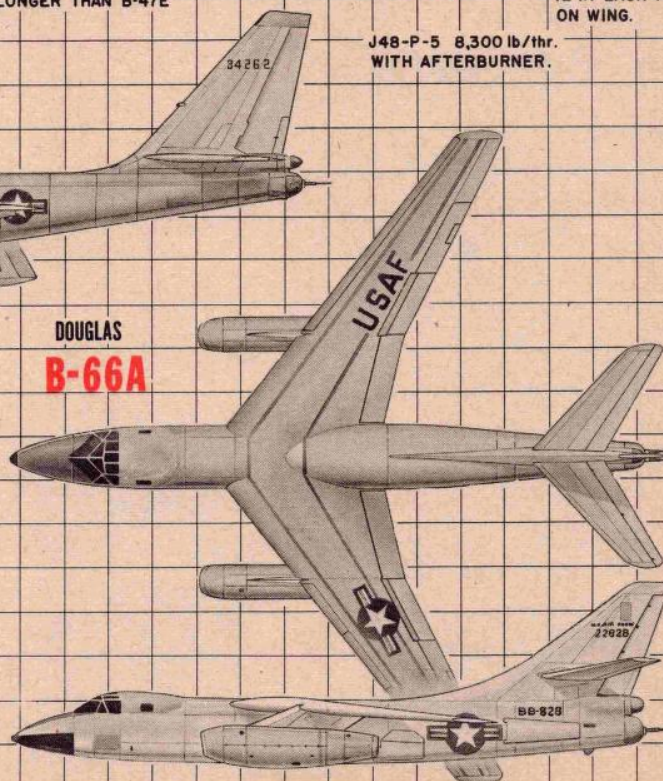
**F-94C**24 2.75 FFAR  
ROCKETS IN NOSE  
12 IN EACH POD  
ON WING.J48-P-5 8,300 lb./thr.  
WITH AFTERBURNER.

McDONNELL

**F-101A**

2 J57-P-13 9,500 lb./thr. ea.

DOUGLAS

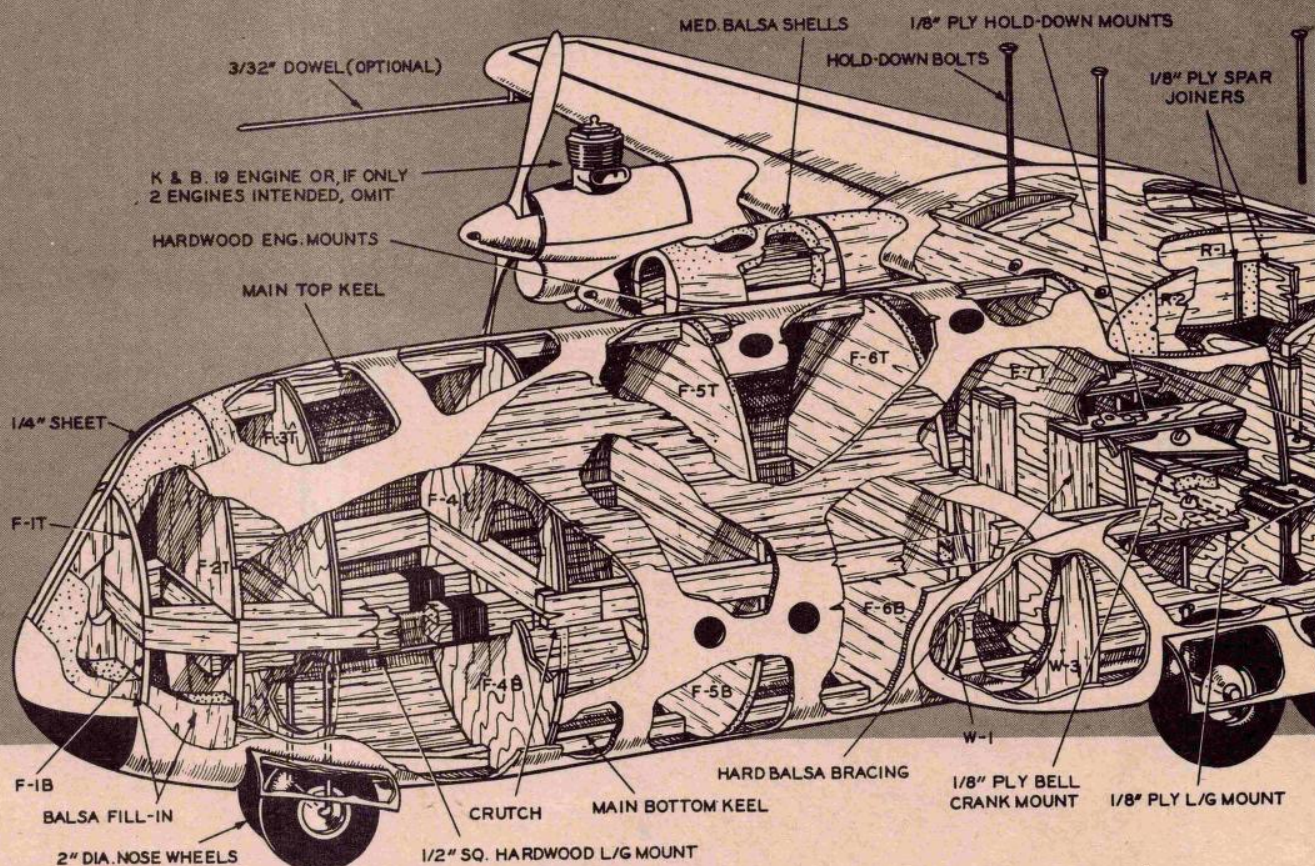
**B-66A**

2 J71-A-9 9,700 lb./thr. ea.



# This Spectacular Lockheed "Hercules" Model

Take your choice: two .19-size powerplants or four .09's; but either way you'll have the most publicized model in your town!



Hank is Lockheed tool inspector; this is his 1st flying model.

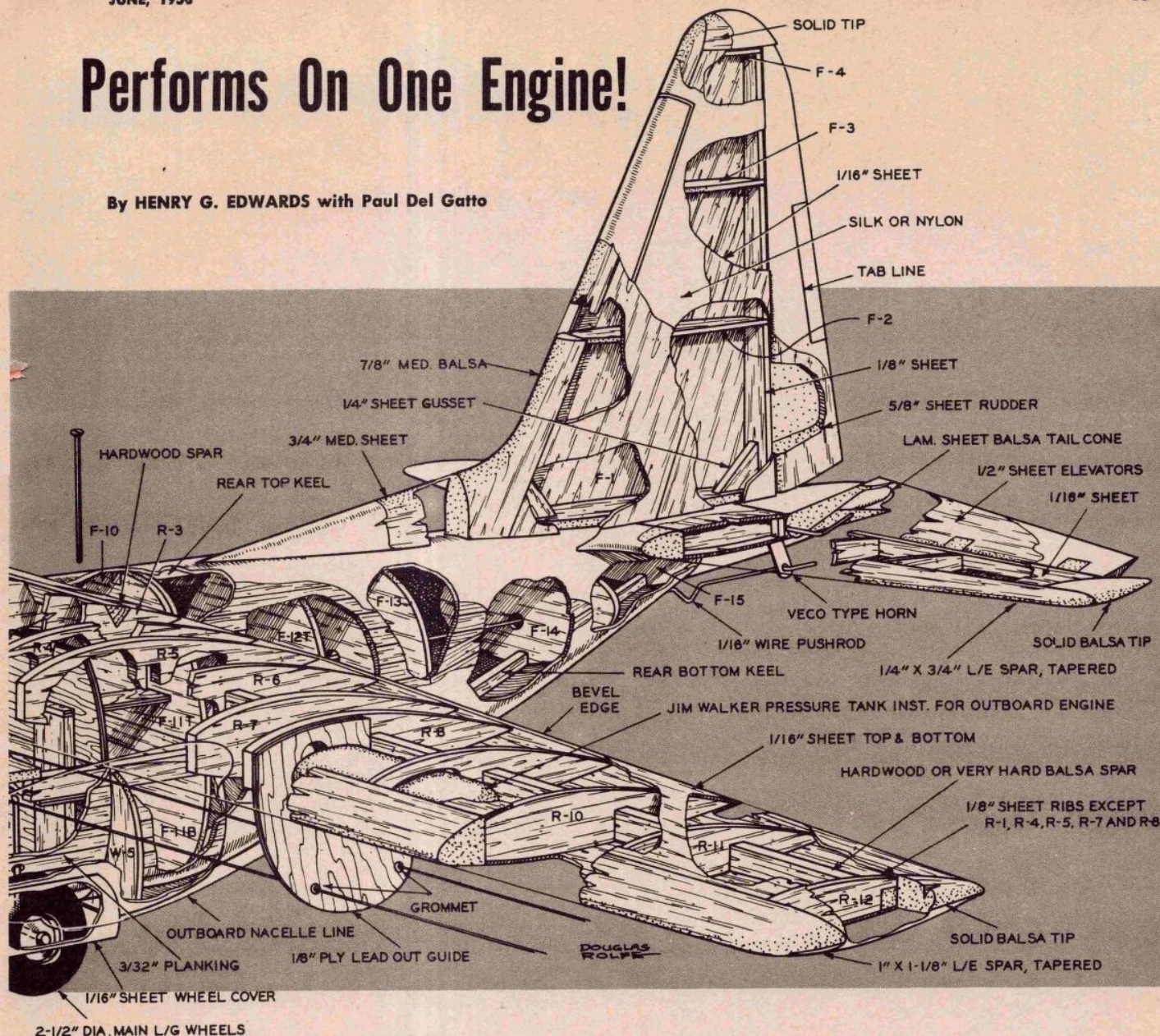
## Air Force's C-130

Makes King-Size  
Control Line Project



# Performs On One Engine!

By HENRY G. EDWARDS with Paul Del Gatto



■ Being a Lockheed employee I was naturally quite close to this particular aircraft; the more I saw of the Hercules C-130 the more convinced I was that I wanted it to be my first multi-engine project. Its gargantuan proportions impressed me. But it went deeper than that, for incorporated into the design were many features which justified its being called the "freighter of the future." One of its unusual features is the low-slung fuselage incorporating a floor that is the same height as truck beds. Up-swept tail arrangement is utilized to accommodate rear-end loading.

Flight tests have indicated that the speed of Hercules will surpass that of our present luxury airliners; the C-130 can land on an 800 ft. runway. Considering that fully loaded the Hercules weighs in at about 54 tons (of which about 20 tons are cargo) and it has a 132 ft. wingspan, "impressive" is the right word.

There's a total of 15,000 horsepower behind the 4 turboprops. Unusual is the use of deeper camber for the bottom of the stabilizer than for the top. Maybe

the engineers who thought up this feature were old "Pacer" addicts.

(Model bugs new to the hobby may not have heard about Sal Taibi's free-flight "Pacer" design which incorporated an inverted stab and was one of the hottest designs of the early '40's. It's still a strong favorite with many old-timers and it still brings home the bacon at contests.)

But getting back to "Hercules" and control-line models in general: Nothing can hold a candle to a multi-engine model, particularly if it is a scale replica.

Certainly you can't build this multi-engine model overnight or even over a weekend. What we prefer is the kind of project that can really be called model building. Ask anybody who has tried multi-engine designs, when it comes to flying there's nothing that can challenge the roar of two or more engines in synchronization; or that breathtaking moment when the model is released and it accelerates for a take-off.

If this is your first multi-engine design we suggest you install two engines op-

erating on the inboard nacelles; leave the engines off on the outboard nacelles. Two K. & B. .19's proved more than ample power for us and the model even performed on one!

We have gained sufficient confidence to convert over to four .09's and performance has been to everyone's satisfaction. What has improved still more is our ground operations prior to each flight. We've gotten so we look like centipedes-on-the-double.

If you're an old hand at multi-engines, you might decide on the four .09's to begin with.

## CONSTRUCTION

With this project it is advisable to begin construction with the wings and tail surfaces, for then things will be easier in the final assembly. The wing, stab and fin ribs are cut from hard sheet balsa. In all probability most of the wood lengths you'll be using for the wing loading edge and spar will be 3 feet, and so will require splicing. Wing spar



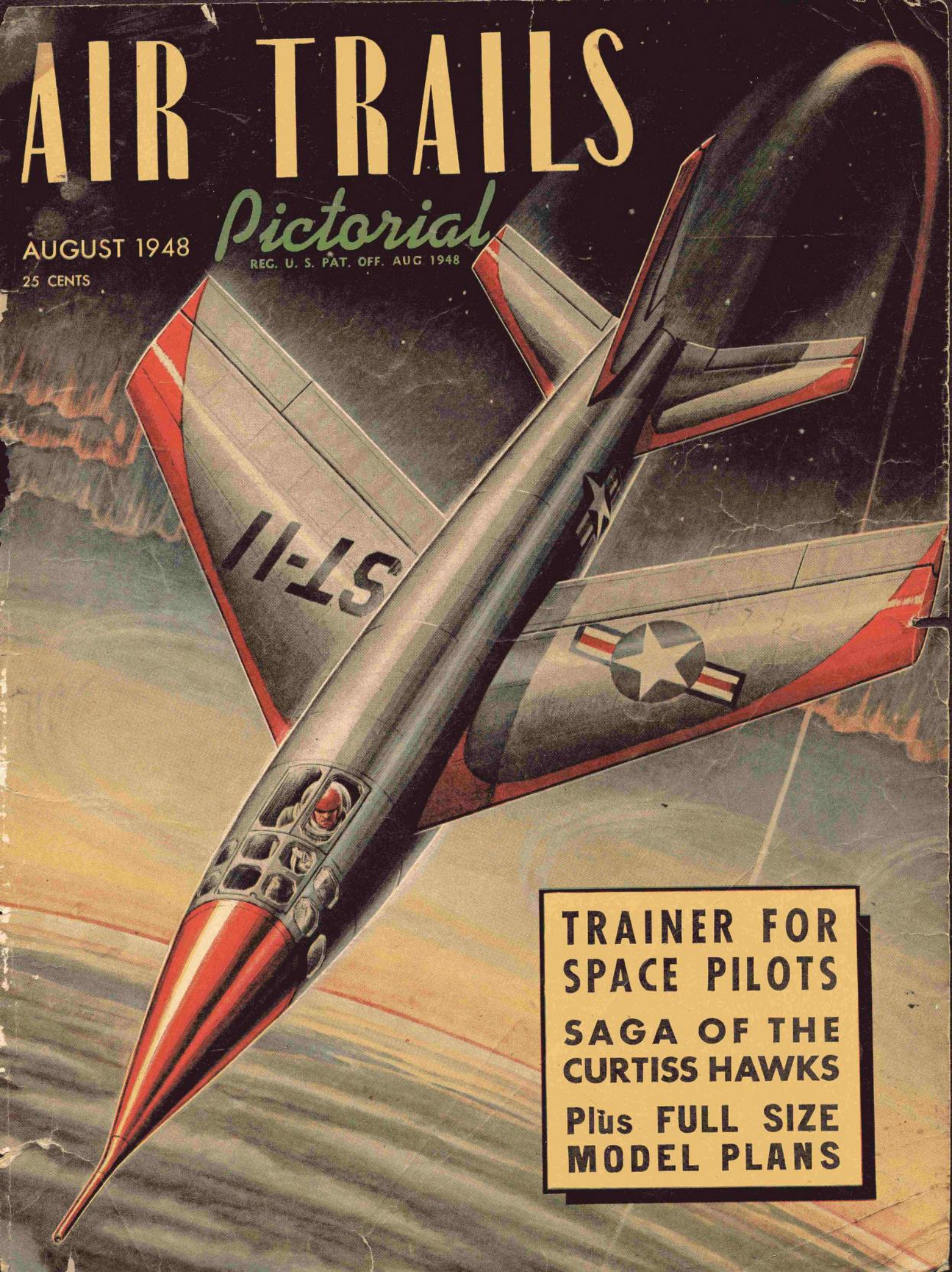
# AIR TRAILS

*Pictorial*

AUGUST 1948

25 CENTS

REG. U. S. PAT. OFF. AUG 1948



**TRAINER FOR  
SPACE PILOTS  
SAGA OF THE  
CURTISS HAWKS  
Plus FULL SIZE  
MODEL PLANS**



# AIR TRAILS

## Pictorial

## contents

**AUGUST, 1948**  
**VOLUME XXX, NO. 5**



The winged rocket on this month's cover is not a figment of wild imagination. It represents a carefully thought out design of a training aircraft for space pilots. Even now the services and the scientists are seriously thinking of launching a pilotless missile into interplanetary space, and flights into the void by piloted rockets are no longer a dream but a future possibility. Before we can send humans into space we must train men to fly the aero-ballistic planes. The ship to train them in is still a problem. Author Anderton presents one logical possibility.

|                                            |                       |    |
|--------------------------------------------|-----------------------|----|
| SPACE TRAINER . . . . .                    | David A. Anderton     | 21 |
| AFAU . . . . .                             | Major John L. Frisbee | 24 |
| PYLON ARTIST . . . . .                     | John L. MacKenzie     | 26 |
| THE SAGA OF THE CURTISS HAWKS . . . . .    | Peter M. Bowers       | 27 |
| AIR PROGRESS: PROPELLERS . . . . .         | Douglas Rolfe         | 30 |
| HOW TO GO MAD IN EIGHT MINUTES . . . . .   | Bob Arentz            | 33 |
| WE FLY THE STINSON STATION WAGON . . . . . | William Winter        | 34 |
| PHOTO COMPETITION . . . . .                |                       | 36 |
| BOJO . . . . .                             | Henry Nelson          | 39 |
| CIRCLE "30" . . . . .                      |                       | 44 |
| CLIMAX . . . . .                           | Charles Folk          | 45 |
| CALIFORNIA CAPERS . . . . .                |                       | 48 |
| CHAMPMAKER . . . . .                       | Henry Struck          | 50 |
| "PIXIE" . . . . .                          | Claude McCullough     | 57 |
| MARTIN XB-48 JET BOMBER . . . . .          | H. A. Thomas          | 58 |
| THE SKIDOO "23" . . . . .                  | William Winter        | 60 |
| WATCH THAT WARP! . . . . .                 | C. O. Wright          | 62 |
| GRIFO . . . . .                            |                       | 65 |
| FEATHERETTE . . . . .                      |                       | 66 |
| CONSOLIDATED VULTEE XP-81 . . . . .        |                       | 67 |
| CHUTE 'EM DOWN . . . . .                   | Henry Struck          | 68 |
| TAYLORCRAFT . . . . .                      | Ted Vogel             | 69 |

### DEPARTMENTS

|                                               |                    |     |
|-----------------------------------------------|--------------------|-----|
| The Readers Write . . . . .                   |                    | 9   |
| Showcase . . . . .                            |                    | 10  |
| Development Highlights . . . . .              |                    | 14  |
| Air Notes . . . . .                           | John Forney Rudy   | 17  |
| Solo Club . . . . .                           |                    | 32  |
| Airmen of Vision Design Competition . . . . . |                    | 38  |
| Model Matters . . . . .                       |                    | 42  |
| Dope Can . . . . .                            | Val A. Luce        | 63  |
| Report from Washington . . . . .              | Russell W. Nichols | 64  |
| Sketchbook . . . . .                          |                    | 72  |
| The Last Word . . . . .                       |                    | 120 |

Comments and suggestions concerning articles and plans appearing in this publication are always welcome. Readers are cordially invited to express their views on the type of material they prefer.

|                           |                           |
|---------------------------|---------------------------|
| ALBERT L. LEWIS . . . . . | Editor                    |
| ALEXIS DAWYDOFF . . . . . | Technical Aviation Editor |
| W. F. TYLER . . . . .     | Art Director              |
| AUBREY KOCHMAN . . . . .  | Associate Art Director    |
| PETER SWIFT . . . . .     | Editorial Production      |
| MARCELLA FLYNN . . . . .  | Editorial Assistant       |

### STREET & SMITH PUBLICATIONS, INC.

|                                                                   |                              |
|-------------------------------------------------------------------|------------------------------|
| ALLEN L. GRAMMER . . . . .                                        | Chairman of the Board        |
| GERALD H. SMITH . . . . .                                         | President                    |
| HENRY W. RALSTON . . . . .                                        | Vice-President and Secretary |
| THOMAS H. KAISER . . . . .                                        | Treasurer                    |
| C. W. Fuller, Advertising Director, 122 E. 42nd St., New York 17; |                              |
| S. C. Smart, Western Advertising Director, 230 No. Michigan Ave., |                              |
| Chicago 1; R. E. Park, West Coast Advertising Manager, 903 Gar-   |                              |
| field Bldg., Los Angeles 14, and 275 Post St., San Francisco 8.   |                              |

Monthly publication issued by Street & Smith Publications, Incorporated, 122 East 42nd Street, New York 17, N. Y. Copyright, February, 1948, in U. S. A. and Great Britain by Street & Smith Publications, Inc. Reentered as Second-class Matter, August 25, 1947 at the Post Office at New York, N. Y., under Act of Congress of March 3, 1879. 25 cents per copy—\$2.50 per year. \$2.75 per year in countries of the Pan-American Union; \$3.00 per year in Canada; \$3.25 per year elsewhere.

ALL SUBSCRIPTION CORRESPONDENCE  
SHOULD BE ADDRESSED TO  
P. O. BOX 494, ELIZABETH, N. J.

All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or artwork. Any material submitted must include return postage.

Printed in  the U. S. A.



# DEVELOPMENT HIGHLIGHTS



● The McDonnell XF-85 parasite fighter built for AF to be carried in bomb bay of B-36. Powered by Westinghouse J-34 jet engine developing 3,000 lbs. of thrust.



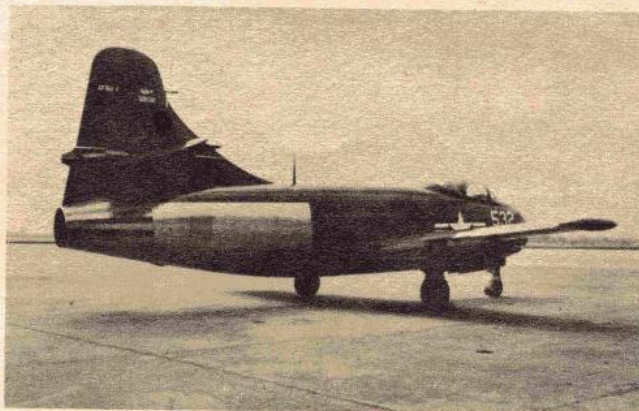
● The Sedan, Aeronca's entry in the four-place personal plane field. Span 37' 6", engine 145 hp Continental, speed 120 mph.



● Arsenal 0-101 French two-place research plane. Observer sits ahead of pilot. Engine 495 hp Renault, speed 280 mph.



● Italian SIAI Marchetti SM 93 dive bomber developed at close of war. Pilot lies prone. Top speed 337 mph, wing span 27'.



● Chance Vought XF6U-1 Navy fighter now has an afterburner to increase thrust. Rear of fuselage modified for device.



● Navy's experimental patrol boat Martin XP5M-1 features long after-body hull for landing and take-off in rougher sea.



# Space Trainer

HOW WILL WE TRAIN SPACE PILOTS FOR THE DAY

INTERPLANETARY TRAVEL? THIS MAY BE THE ANSWER

BY DAVID A. ANDERTON

**S**OONER or later, one man in this country will be living an adventure such as no man ever had before, and traveling into realms where none has ever been. His adventure will make world history, and will end once and for all the centuries of speculation on whether or not his exploration was possible. He will be the first space ship pilot in the world.

Behind him, and behind his first flight, will lie years of training and study. With him he will carry the end results of research and experimentation in metallurgy, chemistry, and aeroballistics, the countless flights of scale models, the ear-splitting roar of rocket motor tests, the reams of figure-covered papers and tables and forms, and days and nights of riveting and welding and tightening fittings.

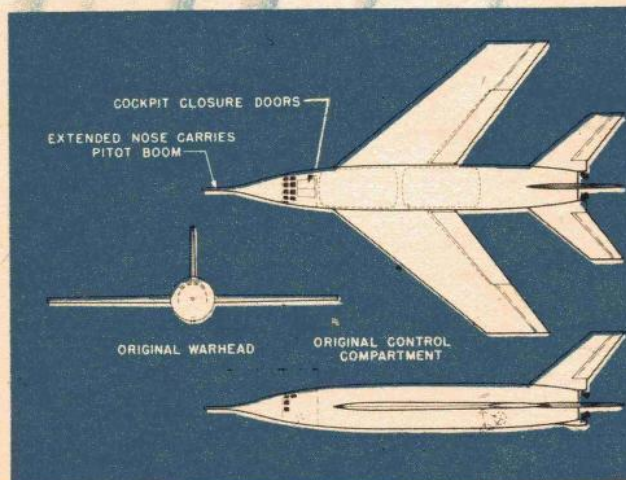
It is perfectly feasible right now to begin a program of pilot training which would culminate in the first man-carrying flight into outer space. Starting today, a pilot could spend about five years in learning the technology of flight at high speeds and altitudes and temperatures, until his response to any emergency would be instinctive. And five years from now, if the space ship were available, he could pilot it into the black void outside the earth's denser atmosphere, the first man to do so.

There exist today, in one form or another, all the devices, airframes, mechanisms and basic knowledge to train a space ship pilot. The only item lacking is the

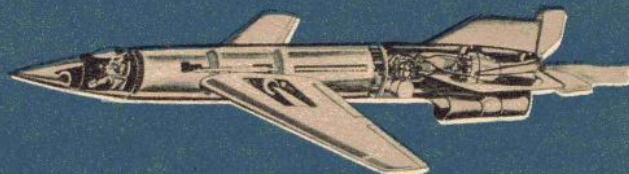
space ship itself—there is none, as a complete unit, at this time. But given the time and the money, we could produce one, and it could be ready when the pilot was.

The problem of training a pilot raises an interesting question. Should we train a human being or build a robot? The idea of a human pilot, in these days of push-button ones, does seem rather stupid at first. Surely a box of wiring and tubes and motors can be built more easily, trained more cheaply, and be less affected by the rigors of an unknown flight than a human pilot. The robot is relatively impervious to heat and cold, high accelerations, lack of oxygen, low pressures, changes in visual acuity—all the things that the human body is not yet conditioned against. The robot can be fitted into an obscure corner of the structure, in a cramped space where there is no light or elbow room. It can be in one place, or in several, scattered all over the ship. It can literally be in many places at once: up in the nose, reading the instruments; back in the tail, watching the rocket flame for signs of poor combustion; out on the wing, gaging its deflections under load. These are good reasons for selecting a mechanical-electronic brain to pilot the first space ship.

There is, however, one big reason for selecting a human pilot rather than a machine. There is no more perfect a mechanism than a man. His mental setup is such that, confronted with an unusual situation, he can



● Below: Reproduction of captured drawing of German piloted version A-9 rocket. Though this aircraft has never gone beyond the drawing stage, the fact is that German scientists as well as the Air Ministry considered the project entirely feasible. Left: Three-view of the space trainer developed in article by author Anderton. Design is based on A-9, but considerably improved.



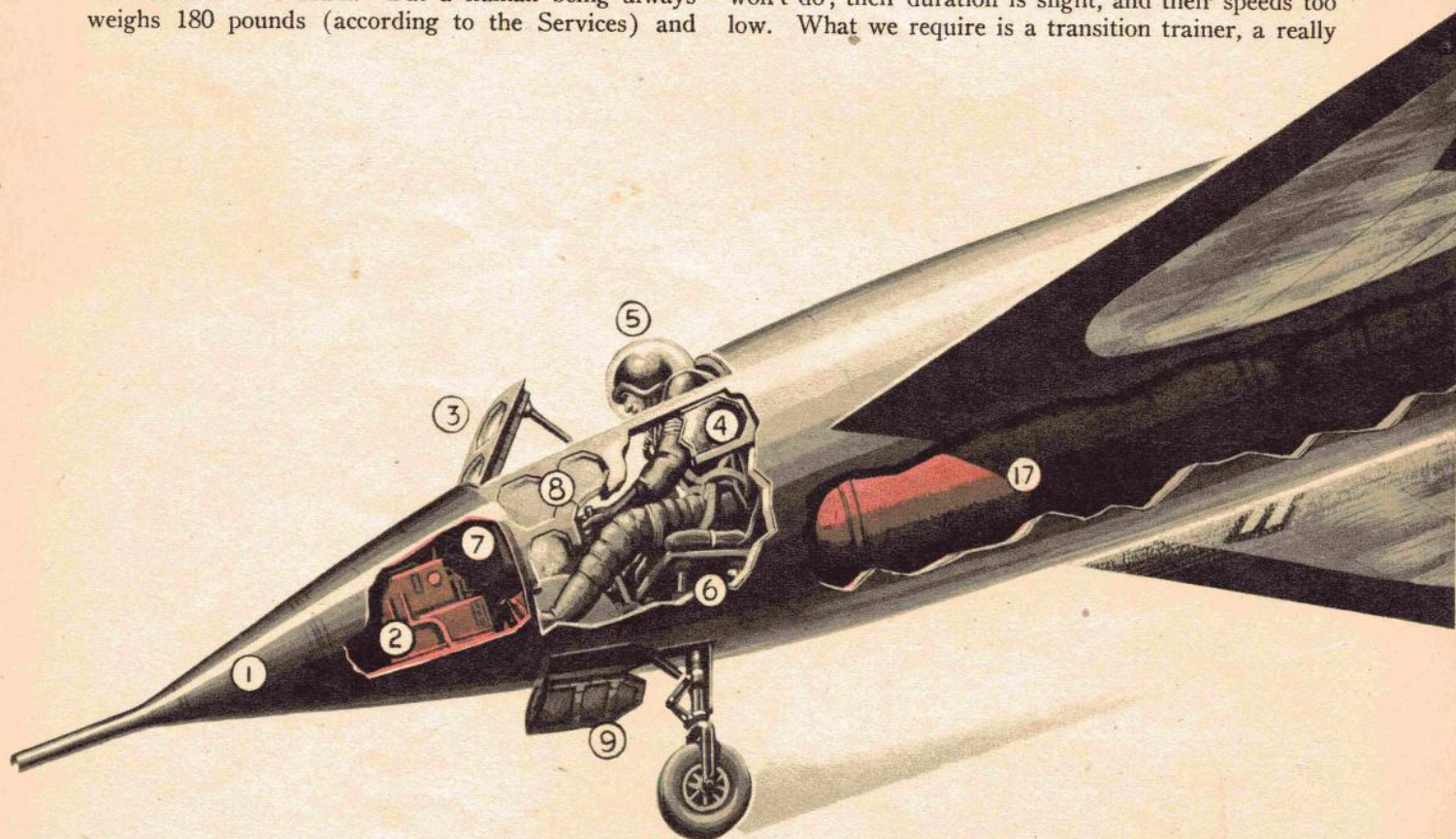


think, and in many cases, do something about it. Here the robot fails. For a machine can react only to the stimuli that it was designed to react to. Even though it is possible to synthesize the five senses, it is impossible to design into a given robot all the possible circuits of reaction to the myriad tangible things in the world. A mechanical brain could tell, by visual observation of the flame characteristics, that combustion was poor. A second part of the brain could then alter the fuel and oxidizer rates until this had been improved, whereupon the first section could observe that the combustion was now correct. A robot pilot could also detect a change in temperature of the outer shell of the rocket motor, or the body of the ship, and increase the flow of coolant to compensate for it. The human pilot also could do these things—a little slower, perhaps. But the unalterable fact is that every time you decide to have the robot do one more thing, his brain must get larger; another set of controls must be added, another circuit wired in. The capacity of the robot pilot is limited by the weight allowance for his brain. But a human being always weighs 180 pounds (according to the Services) and

his brain 55 ounces, no matter how much additional training is crowded into it.

Perhaps the best choice to make right now is a combination of the two. Automatic control and data recording, for example, can be better handled by the robot. Let it also pilot the ship under conditions of flight where a human being would be fatigued or even fighting for consciousness. But for the tricky portions of the flight, and particularly those which call for the exercise of judgment, the human pilot is irreplaceable. Our only problem is to train both of them so that they become acquainted with the capabilities and limitations of each other, and learn to depend upon the other's best qualities.

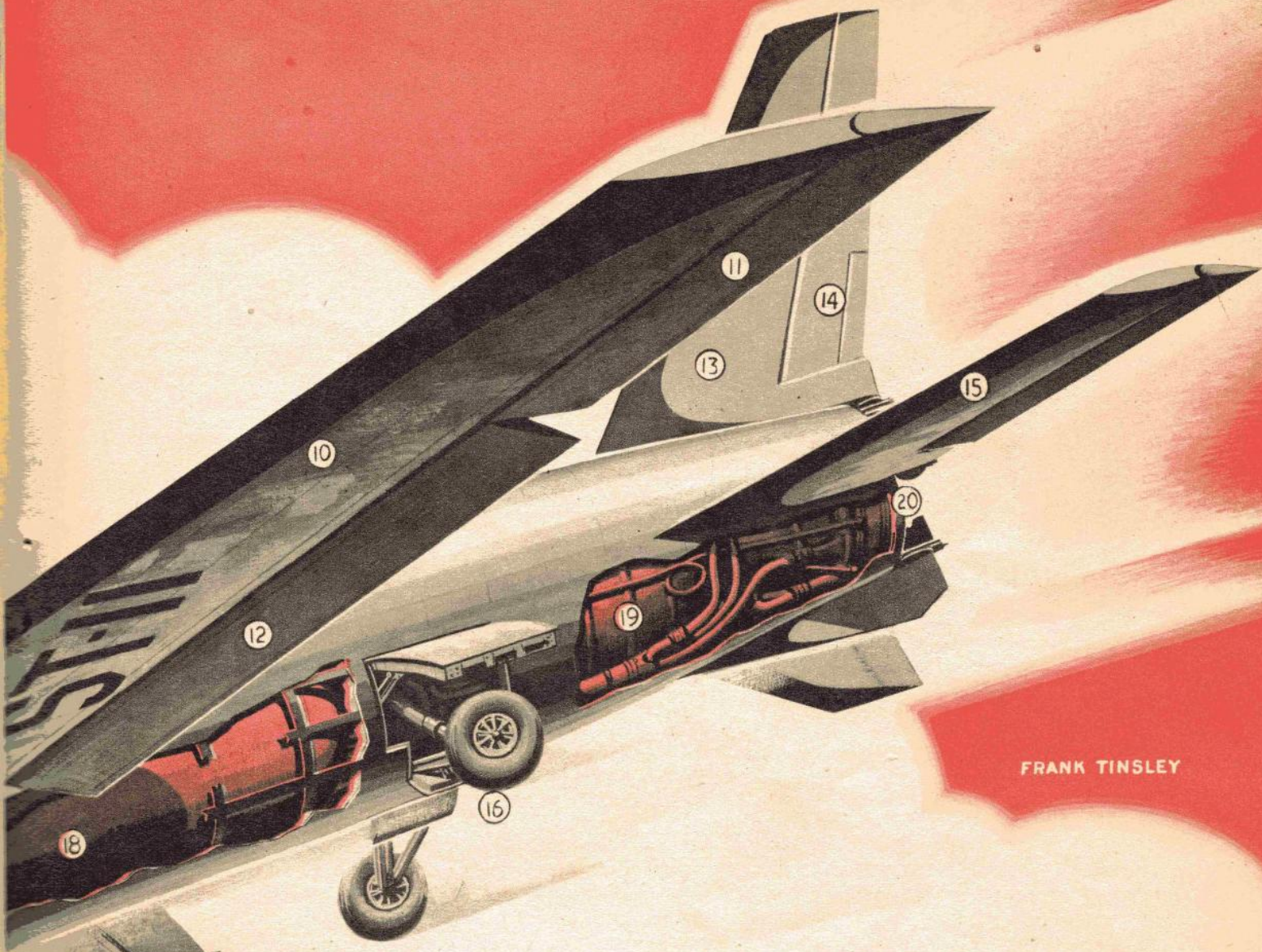
Having the pilot, we require the space ship. In a few years, the genuine article will be available, but suppose we want to start a program of pilot training right now—where is there available a rocket-propelled, supersonic airplane that will serve the need? Both of the Services have experimental supersonic craft, but they won't do; their duration is slight, and their speeds too low. What we require is a transition trainer, a really



● **CUTAWAY OF SPACE TRAINER.** 1: Nose compartment for recording instruments. 2: Cockpit refrigerator. 3: Flush hatch tilts up to become windshield in landing. 4: After-sections of hatch slide sideways beneath skin. 5: Pilot sits with head above cockpit for better vision when landing. 6: Telescopic seat, raised for landing. 7: Flight instrument panel. 8: Portholes for vision at altitude. 9: Nose wheel retracts into well between pilot's feet. 10: Wings of supersonic section, swept back within turbulence angle. 11: Aileron locked for rocket flight, freed

for glide. 12: Flap lowered for landing. 13: Vertical fin swept back. 14: Narrow-chord rudder with trimming surface. 15: Horizontal stabilizer swept back. 16: Landing wheels retract into engine compartment. 17: Fuel tank with 8,400 lbs. of 75% ethyl-alcohol solution in water. 18: Oxidizer tank with 10,620 lbs. of liquid oxygen. 19: Rocket engine—weight, 1,975 lbs.; thrust, 58,000 to 64,000 lbs.; speed, about 3,600 mph. 20: Four expendable jet deflectors in rocket stream provide directional control when rocket engine is in operation.





FRANK TINSLEY

fast flying ship to teach the space ship pilot the tricks of the trade in something close to the actual conditions he will encounter. We still lack that trainer as a tangible aircraft, but the Germans had one—the A9.

Ninth in the series of rocket weapons developed at the *Heeresversuchsanstalt Peenemünde*, the A9 was more or less a standard A4 with wings attached to the body about halfway back. (The A4 is, of course, more familiarly known as the V-2 long-range rocket.) Early in their development program, the Germans realized the need for extending the range of the A4 so that the dispersed British industry could be hammered more effectively. It was a natural idea to fasten some sort of wings on the A4 and operate it as a glider. Such a relatively simple expedient could well double its effective range, and provide the solution the High Command was seeking.

Think a little more about the A9—what does it remind you of? Basically, it is still an artillery rocket, but those wings and controllable tail surfaces and the glider principle make you think of an airplane, don't they? And suppose there were a glassed-in cockpit up forward; wouldn't the deception be complete? Well, the idea is not original, because the Germans thought of it, too. They felt that a cockpit could be provided

near the nose, and that enough equipment to make the pilot reasonably comfortable could be included. Further, it should be possible for him to land the glider when the fuel was exhausted.

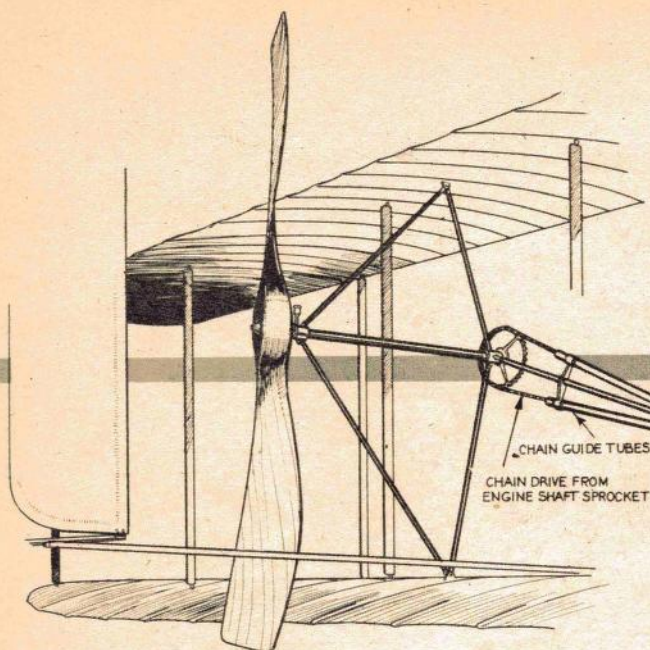
Insofar as is known, the Germans only did paper studies on the piloted A9. They never did get to build one. Let's see if it appears feasible to modify the German A9 to serve our purpose.

Fortunately, a lot of the "dog" work has already been done by the Germans in their work on the A4. The basic design is good, and the firings at White Sands plus the tactical use of the weapon in World War II have proven it further. The powerplant and its fuel and control systems have been tested statically and in flight. The aerodynamic shape is an efficient one for speeds on the order of five times that of sound. It remains to design the wing, and provide space for the pilots and the equipment needed for flights into the black sky 100 miles up.

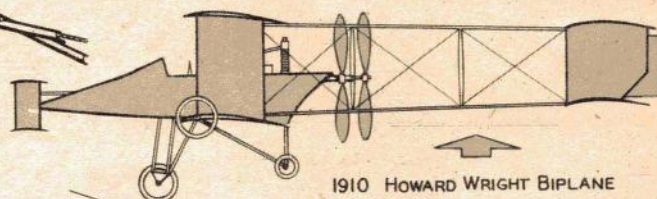
Designing and selecting the wing for a space ship trainer is not the relatively simple task it is for a low-flying fighter or transport craft. In the first place, too many variables are involved, and too little has been previously done, to permit the writing of any sets of tentative design specifications which (Turn to page 101)



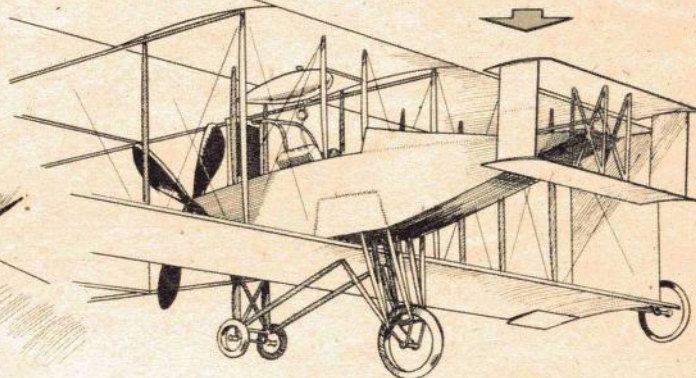
# Air Progress



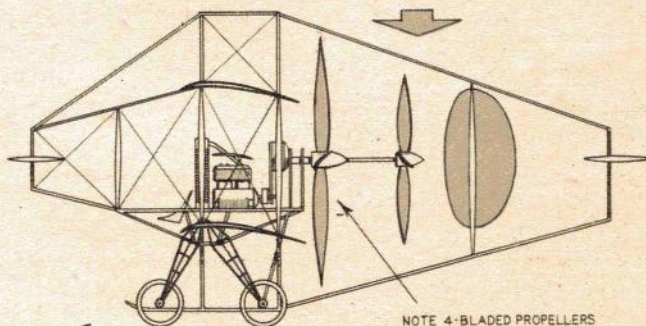
**1903 WRIGHT BROS. BIPLANE**  
DETAIL OF PORT PROPELLER INSTALLATION SHOWING  
CROSSED CHAIN DRIVE EMPLOYED TO OBTAIN COUNTER-  
ROTATION. STARBOARD PROP HAD STRAIGHT CHAIN DRIVE



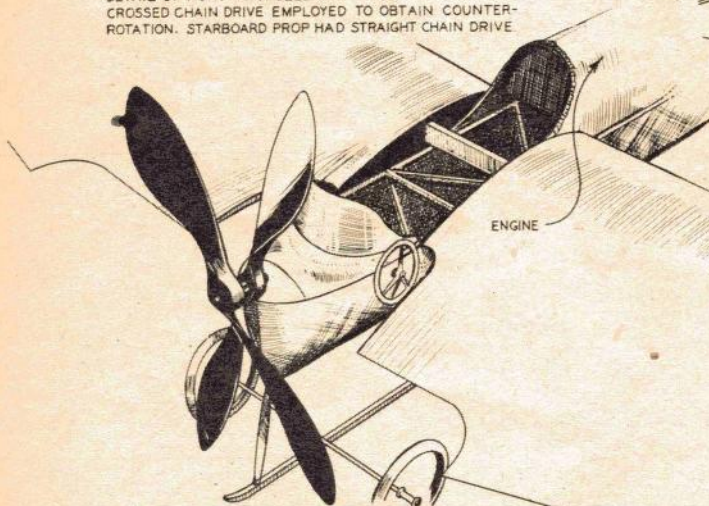
**1910 HOWARD WRIGHT BIPLANE**  
AN EARLY BRITISH DESIGN EMPLOYING CO-  
AXIAL CONTRA-ROTATING PROPELLERS.



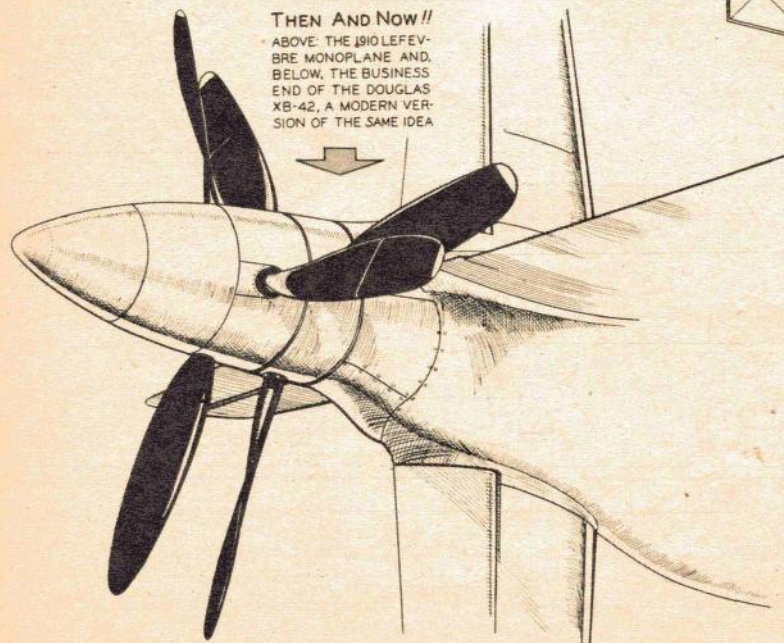
**1910 PIGGOTT BIPLANE**  
ANOTHER EARLY DESIGN FOR COAXIAL  
CONTRA-ROTATING PROPELLERS.



NOTE 4-BLADED PROPELLERS



**THEN AND NOW!!**  
ABOVE, THE 1910 LEVEY-  
BRE MONOPLANE AND,  
BELOW, THE BUSINESS  
END OF THE DOUGLAS  
XB-42, A MODERN  
VERSION OF THE SAME IDEA



Strange as it may seem neither counter rotating nor coaxial propellers represent anything new in aviation design but were the subjects of close attention by even the earliest aeronautical designers. The Wright Brothers employed counter rotating (though not coaxial) propellers in the first successful heavier-than-air flight, and genuine coaxial propellers appeared as early as 1910.

First to revive the coaxial, contra-rotating prop in recent years was the brilliant Anglo-Dutch designer, Koolhoven. His remarkable little fighter, produced around 1936, was so little troubled with

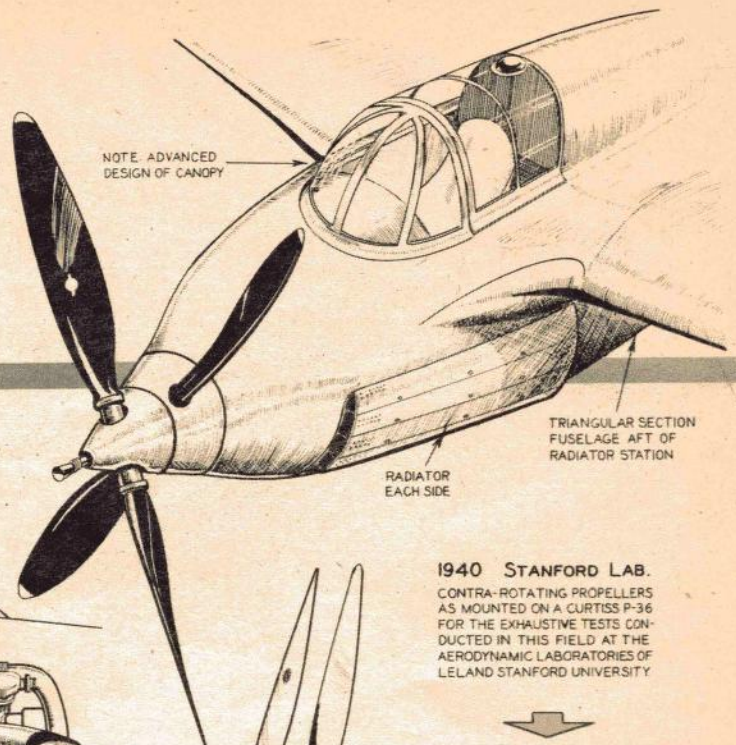
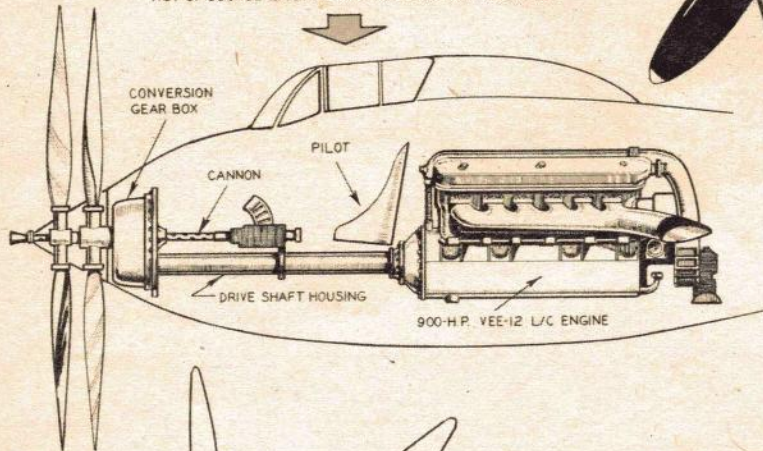


# Development of Counter Rotating and Coaxial-Type Propellers

BY DOUGLAS ROLFE

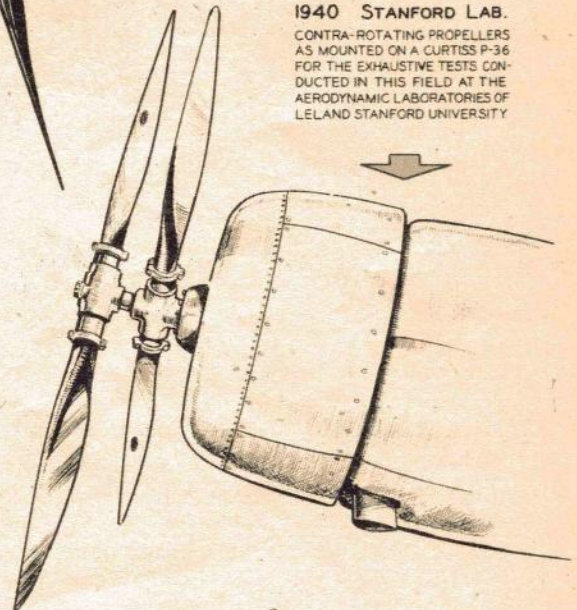
## 1936 KOOLHOVEN FK-55

THIS TRIM LITTLE FIGHTER, THE CREATION OF ONE OF THE WORLD'S TOP AIRPLANE DESIGNERS, SUGGESTS THE MUCH LATER BELL AIRCOBRA THOUGH THE LATTER DESIGN DID NOT OF COURSE INCLUDE CONTRA-ROTATING PROPELLERS.



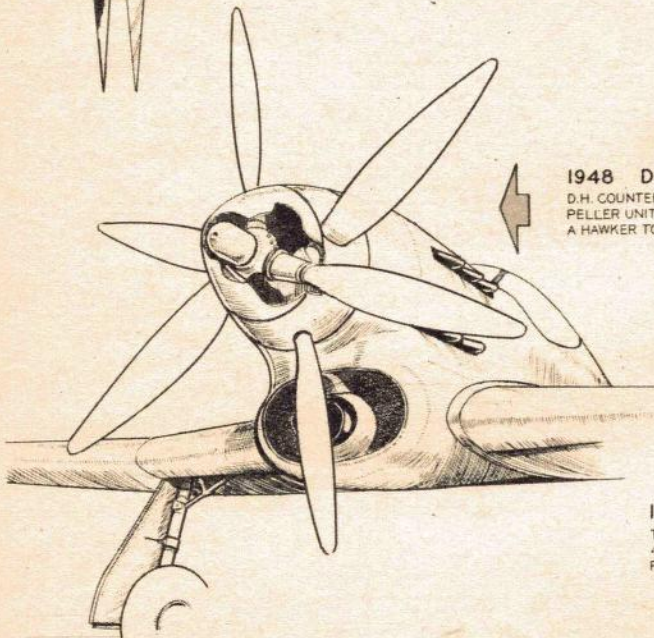
## 1940 STANFORD LAB.

CONTRA-ROTATING PROPELLERS AS MOUNTED ON A CURTISS P-36 FOR THE EXHAUSTIVE TESTS CONDUCTED IN THIS FIELD AT THE AERODYNAMIC LABORATORIES OF LELAND STANFORD UNIVERSITY



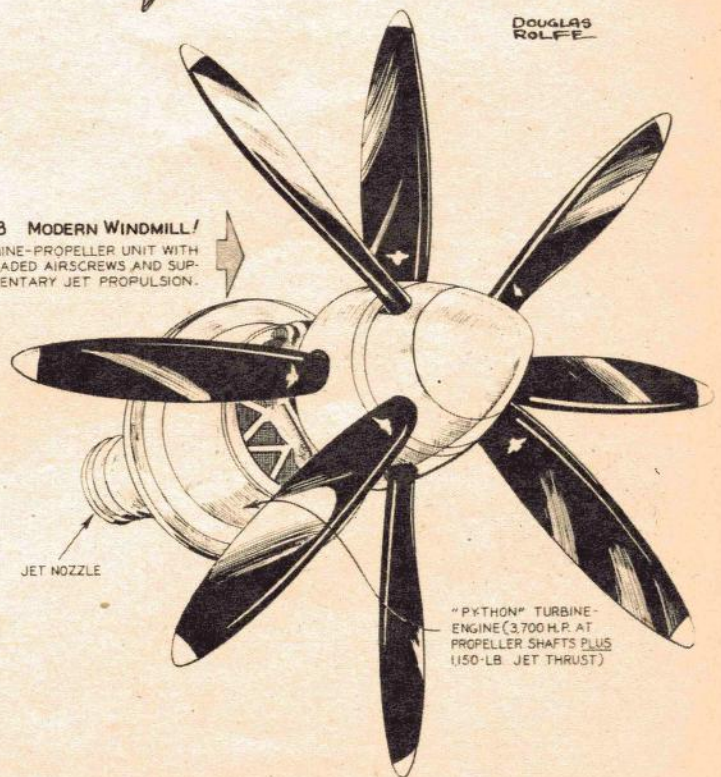
## 1948 DE HAVILLAND

D.H. COUNTER-ROTATING PROPELLER UNIT AS MOUNTED ON A HAWKER TORNADO-VULTURE



## 1948 MODERN WINDMILL!

TURBINE-PROPELLER UNIT WITH 4-BLADED AIRSCREWS AND SUPPLEMENTARY JET PROPULSION.



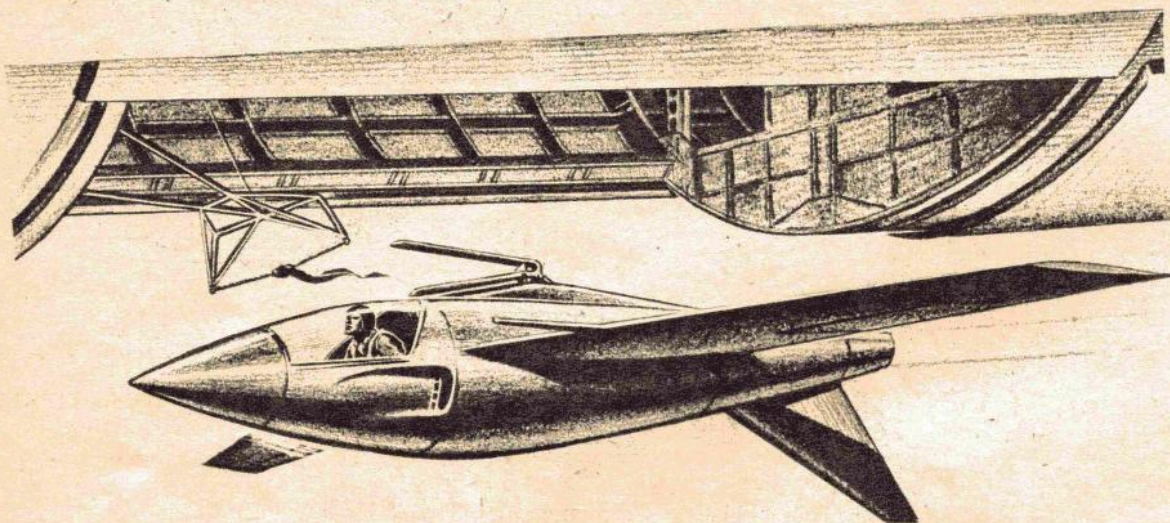
problems of torque that even conventional ailerons proved unnecessary and lateral control was maintained by wing slots or a species of spoilers. Interest in the U.S. in the coaxial prop probably dates from the Army tests conducted at the Aerodynamic Laboratory of Leland Stanford University.

Coaxial, contra-rotating propellers offer slower and much more efficient propeller speeds. The turbine-propeller-jet combination is likely to become more common on large airliners since it is the logical step between conventional propellered aircraft and pure jet propulsion.

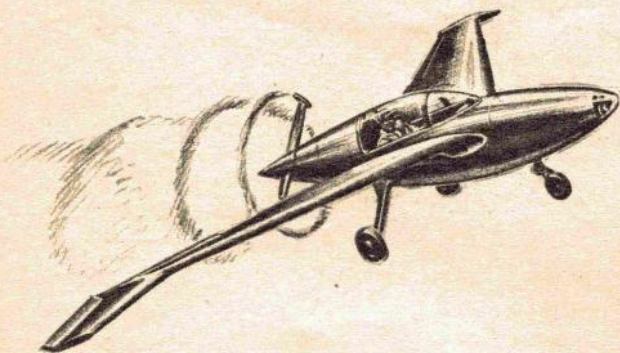


# Airmen of Vision

## DESIGN COMPETITION

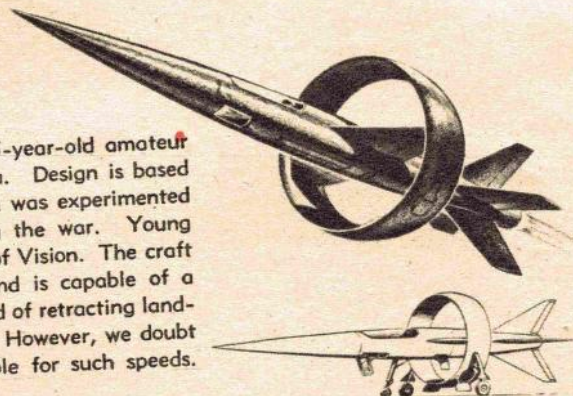


● First place winner (an amateur entrant) is Don Longmire of Gardena, Calif., who came up with a parasite fighter, right on the heels of the Air Force announcement of the McDonnell XF-85. Longmire uses a flying-wing configuration with fuselage for the location of a ram-jet engine and prone pilot. Projected speed is 1000 mph. This is too optimistic and impractical, as the exceptionally high speed of the parasite will create considerable difficulty in recovering the plane by the mother ship. The ram-jet engine itself is not sufficiently flexible in operation to permit the fine throttling necessary for hooking on to the bomber. However, this very interesting design warrants consideration, and is in keeping with modern military trends.



● Designed by amateur Phil Graham of Arlington, Va., this flying wing airplane features a single bladed jet-prop. The jet unit constitutes the powerplant of the aircraft. Fuel into the jet is fed through hollow prop blade. This type of powerplant has been experimented with by the NACA and shows great promise, as it has all the advantages of propeller-driven craft without any of its problems, such as torque.

● Circular wing plane by 15-year-old amateur V. L. Modeland of Boone, Ia. Design is based on guided missile Roc which was experimented with by the services during the war. Young Modeland is a true Airman of Vision. The craft employs a rocket engine and is capable of a speed of 1000 mph. Method of retracting landing gear is quite ingenious. However, we doubt that circular wing is suitable for such speeds.



[See Rules on Page 84]



PROPJET DRIVES FOUR-BLADED  
PROPELLER - 12' DIAMETER.

POWERED BY GENERAL ELECTRIC TG-100  
"PROPJET" IN NOSE AND CONVENTIONAL  
GE-40 TURBO-JET IN REAR OF FUSELAGE

TOP SPEED --- OVER 500 M.P.H.  
GROSS WEIGHT --- 19,500 LB.

WING SPAN --- 50' 6"  
OVERALL LENGTH --- 44' 8"  
HEIGHT (3 PT.) --- 13' 6"

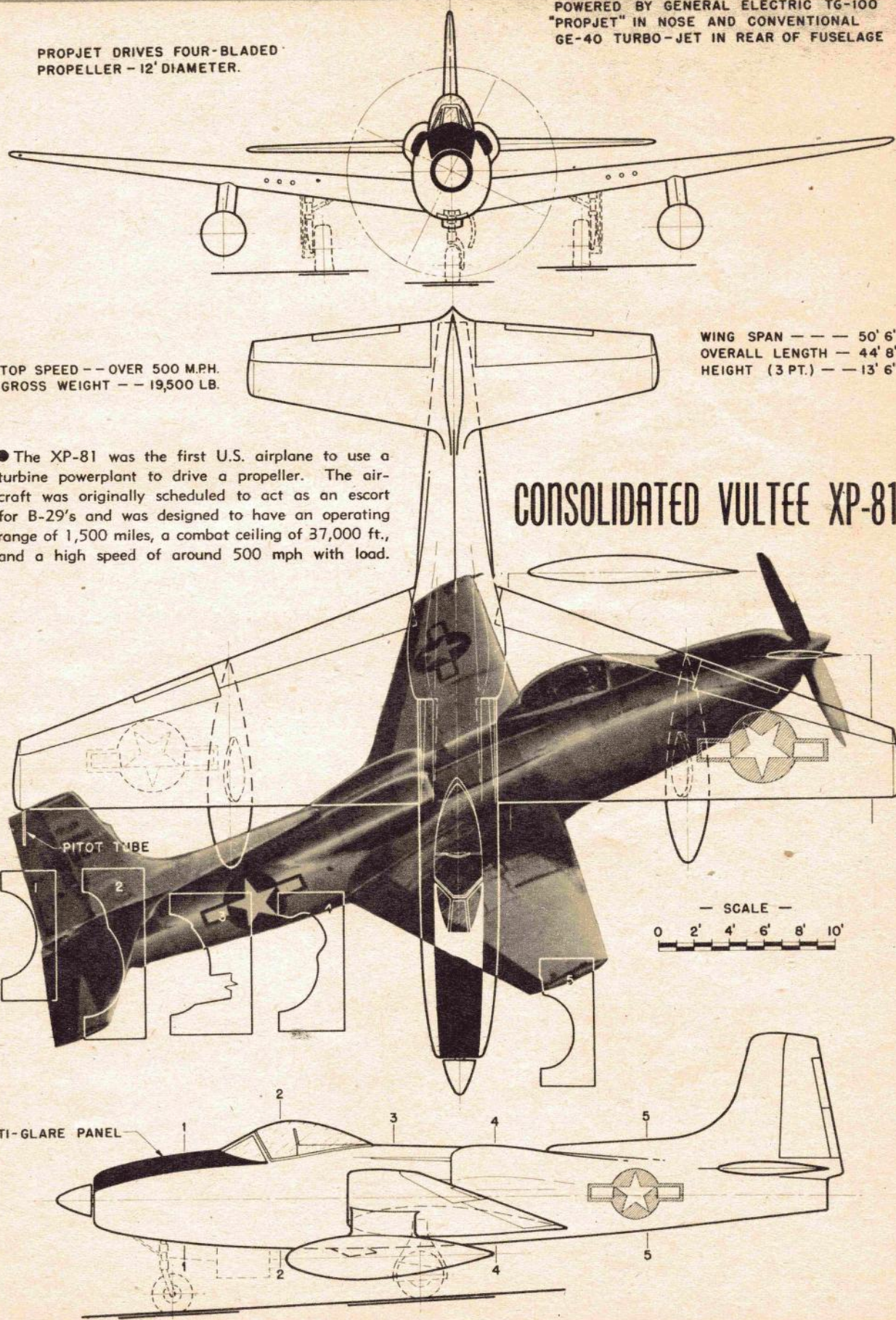
● The XP-81 was the first U.S. airplane to use a turbine powerplant to drive a propeller. The aircraft was originally scheduled to act as an escort for B-29's and was designed to have an operating range of 1,500 miles, a combat ceiling of 37,000 ft., and a high speed of around 500 mph with load.

## CONSOLIDATED VULTEE XP-81

ANTI-GLARE PANEL

PITOT TUBE

— SCALE —  
0 2' 4' 6' 8' 10'





# AIR TRAILS

## *Pictorial*

REG. U. S. PAT. OFF. APRIL 1948

APRIL 1948

25 CENTS



**JET FLYING WING  
COLOR SPREAD**

**FULL SIZE PLANS  
FOR MODELERS**

FRANK TINSLEY



# AIR TRAILS

## Pictorial

## contents

**APRIL, 1948**  
**VOLUME XXX, NO. 1**



This month's cover features the painting of the Northrop YB-49 done by Frank Tinsley, aviation's foremost artist, whose work frequently appears in the pages of Air Trails Pictorial. Always far ahead in his ideas, Tinsley's paintings and drawings featured, years ago, aircraft that are just now coming into use. In the YB-49 Frank sees his ideal of aircraft. Jack Northrop realized this ideal.

Monthly publication issued by Street & Smith Publications, Incorporated, 122 East 42nd Street, New York 17, N. Y. Copyright, February, 1948, in U. S. A. and Great Britain by Street & Smith Publications, Inc. Reentered as Second-class Matter, August 25, 1947 at the Post Office at New York, N. Y., under Act of Congress of March 3, 1879. 25 cents per copy—\$2.50 per year, \$2.75 per year in countries of the Pan-American Union; \$3.00 per year in Canada; \$3.25 per year elsewhere.

ALL CORRESPONDENCE PERTAINING TO SUBSCRIPTIONS SHOULD BE ADDRESSED TO P. O. BOX 494, ELIZABETH, NEW JERSEY.

All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or artwork. Any material submitted must include return postage.

Printed in the U. S. A.

### AIR POWER BEGINS WITH MODEL AVIATION

|                                                                      |    |
|----------------------------------------------------------------------|----|
| Everett N. Angus                                                     | 19 |
| AVIATION CAREERS INC. . . . . John F. Mason                          | 20 |
| WE PREVIEW THE WHEELAIR 111A . . . . . Joseph H. Wherry              | 22 |
| WINGS FOR YOUR CAMERA . . . . . Hans Groenhoff                       | 24 |
| IMPROVED FLIGHT TRAINING . . . . . George R. Reiss                   | 28 |
| AVIATION CARPENTERS . . . . .                                        | 32 |
| DESIGNER'S DREAM . . . . . Frank Tinsley                             | 34 |
| OLD NEEDLENOSE . . . . . Andrew R. Boone                             | 41 |
| WORLD'S FASTEST MODEL: SNOWFLAKE . . . . . Bill Viets                | 43 |
| SOLID STUFF: GRUMMAN ALBATROSS XJR2F . . . . . H. A. Thomas          | 46 |
| DESIGNING UNDER THE NEW RULES . . . . . Frank Ehling                 | 49 |
| NU-LOOKER FOR THE NEW RULES . . . . . Frank Ehling                   | 49 |
| INSIDE STUFF: MICRO DIESEL . . . . .                                 | 53 |
| CO-ETTE—CO <sub>2</sub> OR RUBBER POWERED MODEL . . . . . Jay Holmes | 55 |
| WHIP POWER THUNDERJET . . . . .                                      |    |
| Jim Walker in collaboration with Bill Tyler                          | 63 |
| WACO U. M. F. SCALE CONTROL MODEL . . . . . Walter L. Schroder       | 64 |

### DEPARTMENTS

|                                                                           |     |
|---------------------------------------------------------------------------|-----|
| Development Highlights . . . . .                                          | 8   |
| Air Trails' Showcase . . . . .                                            | 10  |
| Air Notes . . . . . John Forney Rudy                                      | 15  |
| Solo Club . . . . . C. B. Colby                                           | 27  |
| Air Progress—Development of the Ultra-Light Plane . . . . . Douglas Rolfe | 30  |
| Airmen of Vision Design Competition . . . . .                             | 42  |
| Sketchbook . . . . .                                                      | 48  |
| Model Matters . . . . . The Clubman                                       | 52  |
| Dope Can . . . . . Val A. Luce                                            | 68  |
| Report from Washington . . . . . Russell W. Nichols                       | 68  |
| F. Y. I. . . . .                                                          | 123 |
| The Readers Write . . . . .                                               | 124 |
| The Last Word . . . . .                                                   | 126 |

Comments and suggestions concerning articles and plans appearing in this publication are always welcome. Readers are cordially invited to express their views on the type of material they prefer.

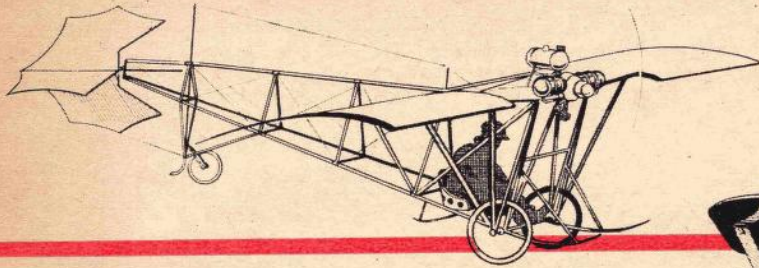
|                             |                           |
|-----------------------------|---------------------------|
| ALBERT L. LEWIS . . . . .   | Editor                    |
| ALEXIS DAWYDOFF . . . . .   | Technical Aviation Editor |
| CHARLES RAVEL . . . . .     | Art Editor                |
| BERTHOLD TIEDEMAN . . . . . | Production Director       |
| PETER SWIFT . . . . .       | Editorial Production      |

### STREET & SMITH PUBLICATIONS, INC.

|                                                                      |                                    |
|----------------------------------------------------------------------|------------------------------------|
| ALLEN L. GRAMMER . . . . .                                           | President                          |
| GERALD H. SMITH . . . . .                                            | Exec. Vice-President and Treasurer |
| HENRY W. RALSTON . . . . .                                           | Vice-President and Secretary       |
| C. W. Fuller, Advertising Director, 122 E. 42 St., New York 17       |                                    |
| S. C. Smart, Western Adv. Dir., 230 No. Michigan Ave., Chicago 1     |                                    |
| R. E. Park, West Coast Adv. Mgr., 903 Garfield Bldg., Los Angeles 14 |                                    |



# AIR PROGRESS



1908—SANTOS DUMONT "DEMOISELLE"

30 H.P. DARRACQ LIQUID-COOLED FLAT TWIN ENGINE. FORERUNNER OF ALL ULTRA-LIGHT AIRPLANES, THIS TINY CRAFT WEIGHED LESS THAN 250 POUNDS AND, THOUGH TRICKY TO FLY, PERFORMED WELL WHEN IN THE HANDS OF EXPERIENCED (AND PINT-SIZED) PILOTS



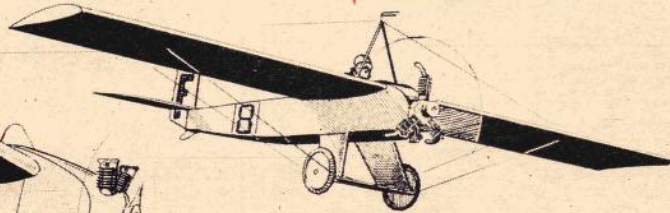
1919—AVRO "BABY"

35 H.P. GREEN LIQUID-COOLED FOUR-IN-LINE ENGINE. — A HIGH-PERFORMANCE SINGLE-SEATER FROM THE SHOPS OF A FIRM WORLD-FAMED TODAY



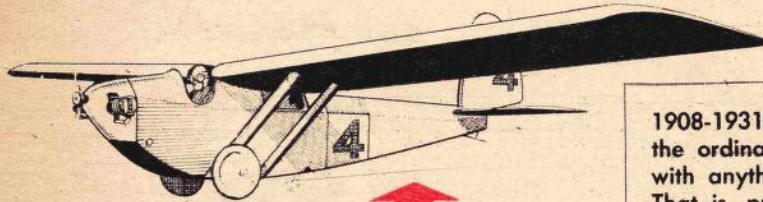
1923-26—AVRO TYPE 506

CONVERTED MOTORCYCLE ENGINE. A LATER AND A HIGHLY SUCCESSFUL DESIGN BY THE SAME CONCERN WHICH PRODUCED THE AVRO BABY.



1924—FARMAN "MOSQUITO"

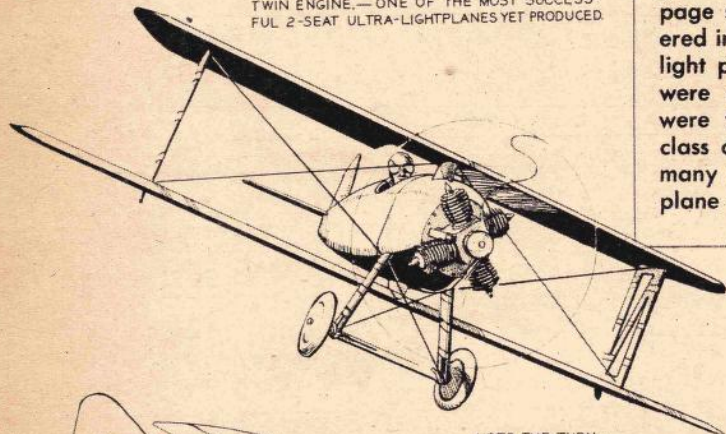
35 H.P. ANZANI AIR-COOLED, FAN-TYPE, RADIAL ENGINE. ONE OF THE VERY FEW TYPES IN THIS CLASS TO MOUNT A GENUINE AIRCRAFT ENGINE IN A PERIOD WHEN CONVERTED MOTORCYCLE ENGINES WERE IN GENERAL USE HERE AND ABROAD



1924—BEARDMORE "WEE BEE 1"

30/40 H.P. BRISTOL CHERUB AIR-COOLED FLAT-TWIN ENGINE. — ONE OF THE MOST SUCCESSFUL 2-SEAT ULTRA-LIGHTPLANES YET PRODUCED

1908-1931 Definition of the ultra-light airplane as opposed to the ordinary light plane is usually based on horsepower rating with anything up to 40 hp forming the ultra-light classification. That is, providing the airplane is adequately powered and not merely underpowered. Judged by these standards the first genuine ultra-light airplane was the Demoiselle shown on this page since, despite its low power rating, it was adequately powered in an era when most airplanes were not. Real interest in ultra-light planes dates from about 1922 when many interesting types were developed both here and abroad. In many cases they were the products of top-flight aviation firms. Interest in this class died out at the end of this period although in some cases many of the better designs automatically passed into the light plane class as larger and more powerful engines were installed.



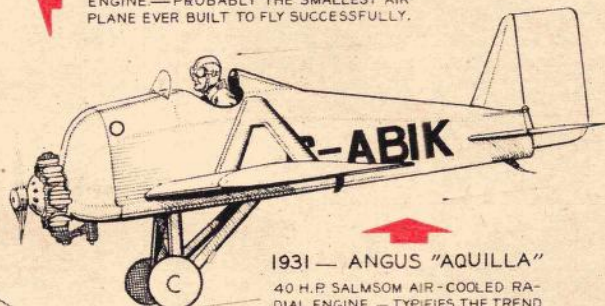
NOTE THE TURN-OVER (CRASH) ARCH

1925—EPPS MONOPLANE

CONVERTED INDIAN MOTORCYCLE ENGINE. ONE OF THE NUMEROUS AMATEUR DESIGNS PRODUCED IN THE U.S.A. DURING THIS PERIOD.

1924—IRWIN "METEORPLANE"

20 H.P. IRWIN AIR-COOLED X-TYPE RADIAL ENGINE. — PROBABLY THE SMALLEST AIRPLANE EVER BUILT TO FLY SUCCESSFULLY.



1931—ANGUS "AQUILLA"

40 H.P. SALMSON AIR-COOLED RADIAL ENGINE. — TYPIFIES THE TREND TOWARDS GREATER POWER WHICH MARKED THE END OF THIS PERIOD.



BY DOUGLAS ROLFE

## DEVELOPMENT OF THE ULTRA-LIGHT PLANE

### 1935 — B.A.C. "DRONE"

VARIOUSLY POWERED WITH ENGINES RANGING FROM 6 TO 35 H.P. — PRODUCTION MODEL AND MODIFICATION OF THE 1932 LOWE-WYLDE POWERED GLIDER

### 1936-7 — AVIONS TIPSY S-1

40 H.P. TRAIN AIR-COOLED FLAT TWIN ENGINE — A NEAT BELGIAN DESIGN WITH A TOP SPEED OF 124 M.P.H. AND GOOD FLYING QUALITIES

### 1935 — MIGNET "POU DU CIEL"

VARIOUSLY POWERED WITH ENGINES RANGING FROM 17 TO 30 H.P. — MODEL SHOWN HERE HAD A 30 H.P. CARDEN-FORD MOTOR

### 1935 — LUTON "BUZZARD"

VARIOUSLY POWERED WITH ENGINES RANGING FROM 25 TO 35 H.P. — THIS WAS AN ADVANCED DESIGN EVEN WHEN CONSIDERED BY TODAY'S STANDARDS

DOUGLAS ROLFE

1935-1948 Interest in ultra-light airplane design was reawakened in 1935, mostly by the introduction of the Pou du Ciel or "Flying Flea." This completely unorthodox design could be purchased in knock-down form and cost very little money. It was also supposed to be simple to fly but a series of fatal crashes ended the Flying Flea vogue soon after it was introduced and it was grounded in both England and France. Despite this, interest in the ultra-light class continued and many of our best light planes today stem from some of the designs developed early in this period—the Aeronca a notable example. Post-war interest in this class still exists with about 15 or 20 types now in existence—mostly in France. This class has practical possibilities for club training due to its low initial cost and extremely low cost of operating.

### 1937 — BELTRAME "COLIBRI"

18 H.P. BELTRAME ENGINE — THIS HIGHLY INTERESTING DESIGN IS OF ITALIAN ORIGIN

### 1947 — S.E.C.A.T., LD-45

40 H.P. MATHIS ENGINE — ONE OF THE FEW BIPLANE TYPES IN THIS CLASS TO APPEAR SINCE THE WAR

### 1947 — LOCKHEED "LITTLE DIPPER"

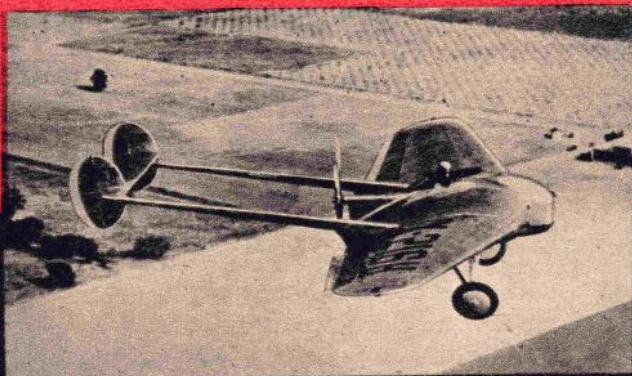
40 H.P. CONTINENTAL ENGINE — A RECENT VENTURE INTO THE ULTRA-LIGHT FIELD BY ONE OF THE TOP FLIGHT AIRPLANE CONSTRUCTION FIRMS IN THE U.S.

### 1947 — ALAPARMA "TUCANO"

38 H.P. C.N.A., C-2 AIR-COOLED FLAT TWIN ENGINE — A POST-WAR ITALIAN DESIGN

NOTE SINGLE LANDING WHEEL  
STEEL WING-TIP SKID





BY FRANK TINSLEY

● Granddaddy of the YB-49 designed by Northrop in 1923. Plane flew successfully in 1929. Note buried engine.

## DESIGNER'S DREAM

WHEN THE YB-49 LIFTED FROM RUNWAY, AIRMEN WITNESSED THE FINAL FLOWERING OF AN ENGINEERING FLIGHT OF FANCY—A DESIGNER'S DREAM COME TRUE

**E**VER since the days of stick and wire "crates," logical minded engineers have sneaked off into quiet corners or paused in mid-munch over forgotten luncheon tables to daydream of the perfect heavier-than-air flying machine. An airplane, please God, with no bulbous fuselage or dragging tail, no exposed engines, no built-in headwinds in the form of wire rigging or fixed landing wheels. Just the essentials of flight, power and control. In short, a slick, smooth, slippery FLYING WING!

Some of the characters actually went the magazine artists one better, muttering wildly of jet or rocket propulsion systems that would even eliminate propellers! Of course these were so obviously nutty that the more conservative dreamers smiled condescendingly and looked around for the squirrels, while "practical"

airplane builders of the day threw up their hands despairingly and consigned the whole lot of them to the booby hatch!

But the enthusiasts persisted in their folly. A Dutchman named Fokker, unwilling to go on building honest, conventional biplanes, insisted upon designing a cantilever wing, internally supported, needing neither struts nor wire bracing. Another, an absent-minded German professor named Junkers, not only improved upon the idea, but actually had the effrontery to build a whole airplane out of metal!

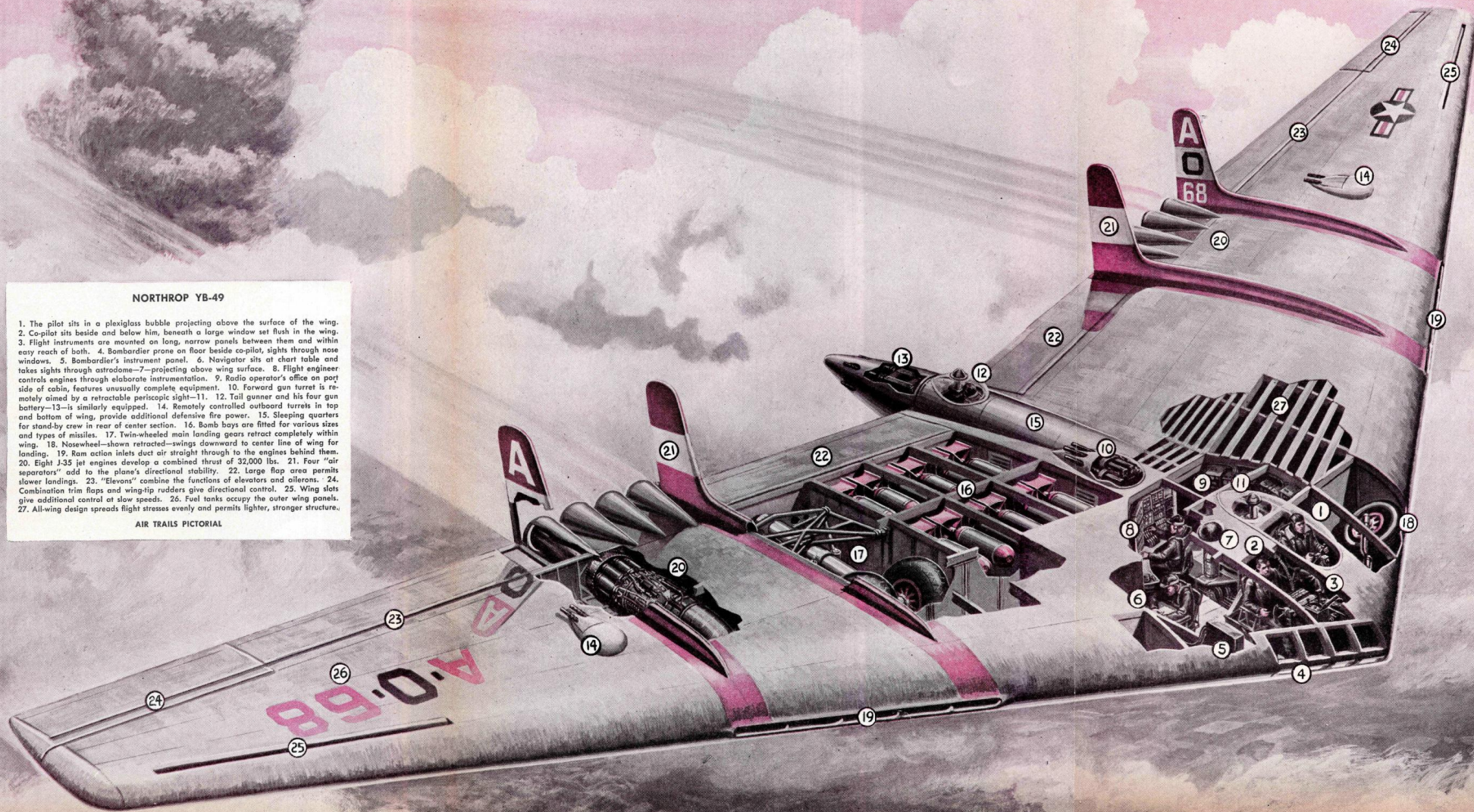
In other parts of the world, other characters were busy with dreamboats. A wild-eyed Yankee by the name of Burgess, teamed up with a crazy Britisher named Dunn and together they designed land and sea-planes without tails, Vee-shaped things (Turn to page 85)



# NORTHROP YB-49

1. The pilot sits in a plexiglass bubble projecting above the surface of the wing.  
2. Co-pilot sits beside and below him, beneath a large window set flush in the wing.  
3. Flight instruments are mounted on long, narrow panels between them and within easy reach of both.  
4. Bombardier prone on floor beside co-pilot, sights through nose windows.  
5. Bombardier's instrument panel.  
6. Navigator sits at chart table and takes sights through astrodome—7—projecting above wing surface.  
8. Flight engineer controls engines through elaborate instrumentation.  
9. Radio operator's office on port side of cabin, features unusually complete equipment.  
10. Forward gun turret is remotely aimed by a retractable periscopic sight—11.  
12. Tail gunner and his four gun battery—13—is similarly equipped.  
14. Remotely controlled outboard turrets in top and bottom of wing, provide additional defensive fire power.  
15. Sleeping quarters for stand-by crew in rear of center section.  
16. Bomb bays are fitted for various sizes and types of missiles.  
17. Twin-wheeled main landing gears retract completely within wings.  
18. Nosewheel—shown retracted—swings downward to center line of wing for landing.  
19. Ram action inlets duct air straight through to the engines behind them.  
20. Eight J-35 jet engines develop a combined thrust of 32,000 lbs.  
21. Four "air separators" add to the plane's directional stability.  
22. Large flap area permits slower landings.  
23. "Elevons" combine the functions of elevators and ailerons.  
24. Combination trim flaps and wing-tip rudders give directional control.  
25. Wing slots give additional control at slow speeds.  
26. Fuel tanks occupy the outer wing panels.  
27. All-wing design spreads flight stresses evenly and permits lighter, stronger structure.

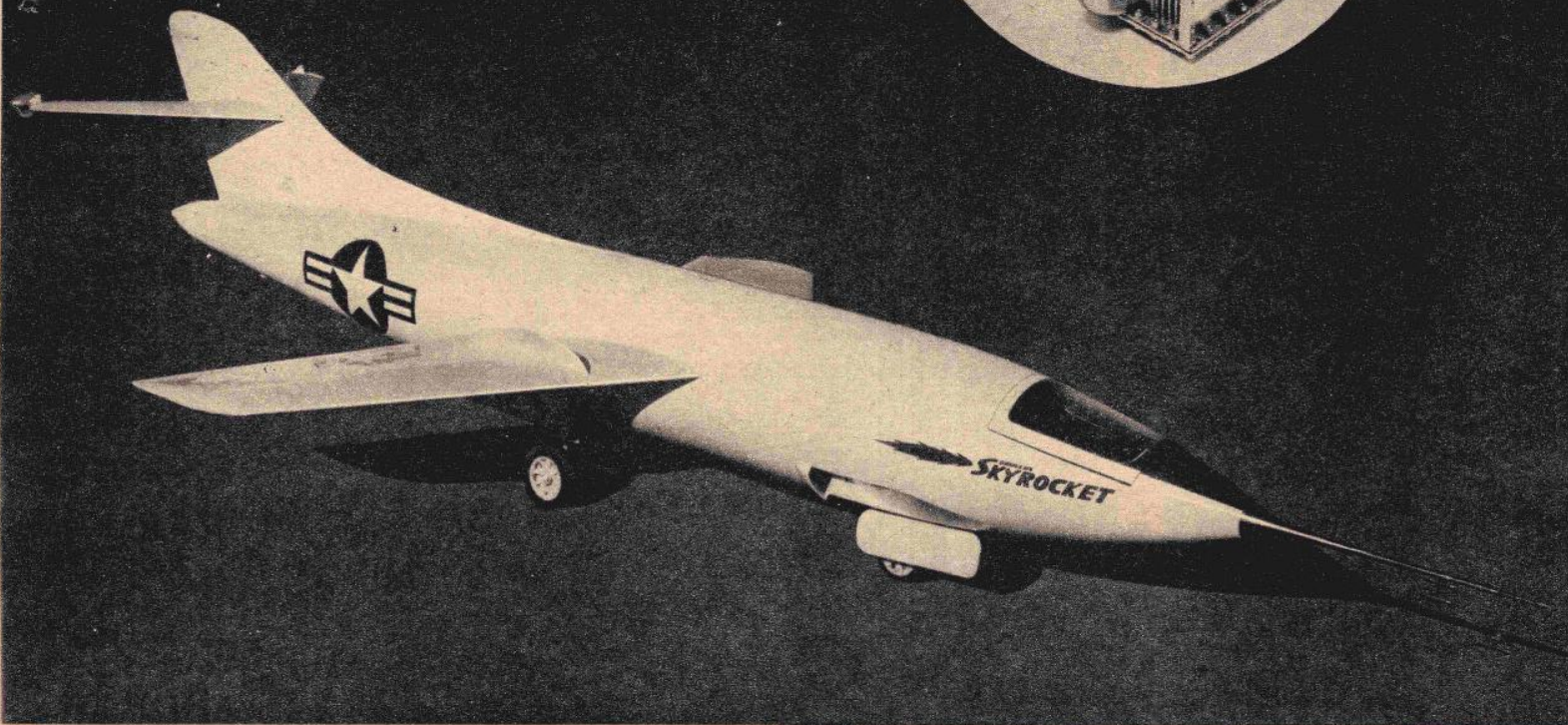
AIR TRAILS PICTORIAL





● This 16 lb. gadget having an output of 40 refrigerators cools cockpit of the Skyrocket.

## OLD NEEDLENOSE



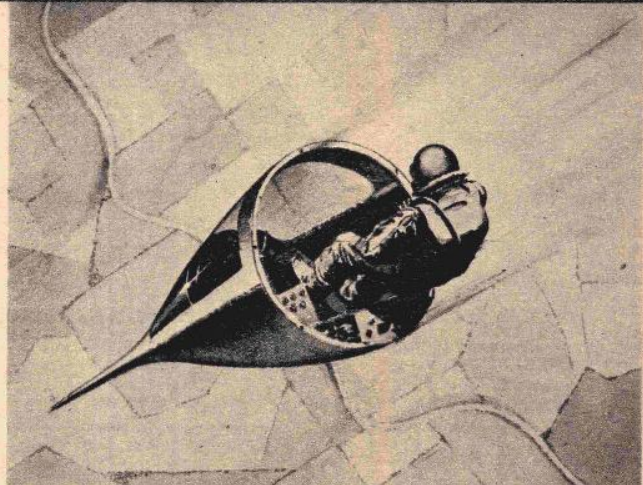
BY ANDREW R. BOONE

THIRD TYPE OF ULTRA-FAST AIRPLANES, THE DOUGLAS SKYROCKET IS DESIGNED TO EXPLORE SUPERSONIC SPEED

**S**UPERSONIC flight by full-scale man-carrying aircraft may soon become reality.

One more candidate for the honors is the Douglas D-558-2 Skyrocket, needle-nosed successor to the Douglas D-558 Skystreak. Unlike the jet-propelled Skystreak, Skyrocket carries both a jet engine and liquid rocket engines. Officially, the slender airplane is stressed to withstand the forces it will encounter at a speed of Mach 1. (Speed of sound: 761 mph. Sea level at temp. of 59° F.). Unofficially, it is confidently expected by those in the know that its magnesium body can absorb the blows forced upon it by somewhat higher speeds.

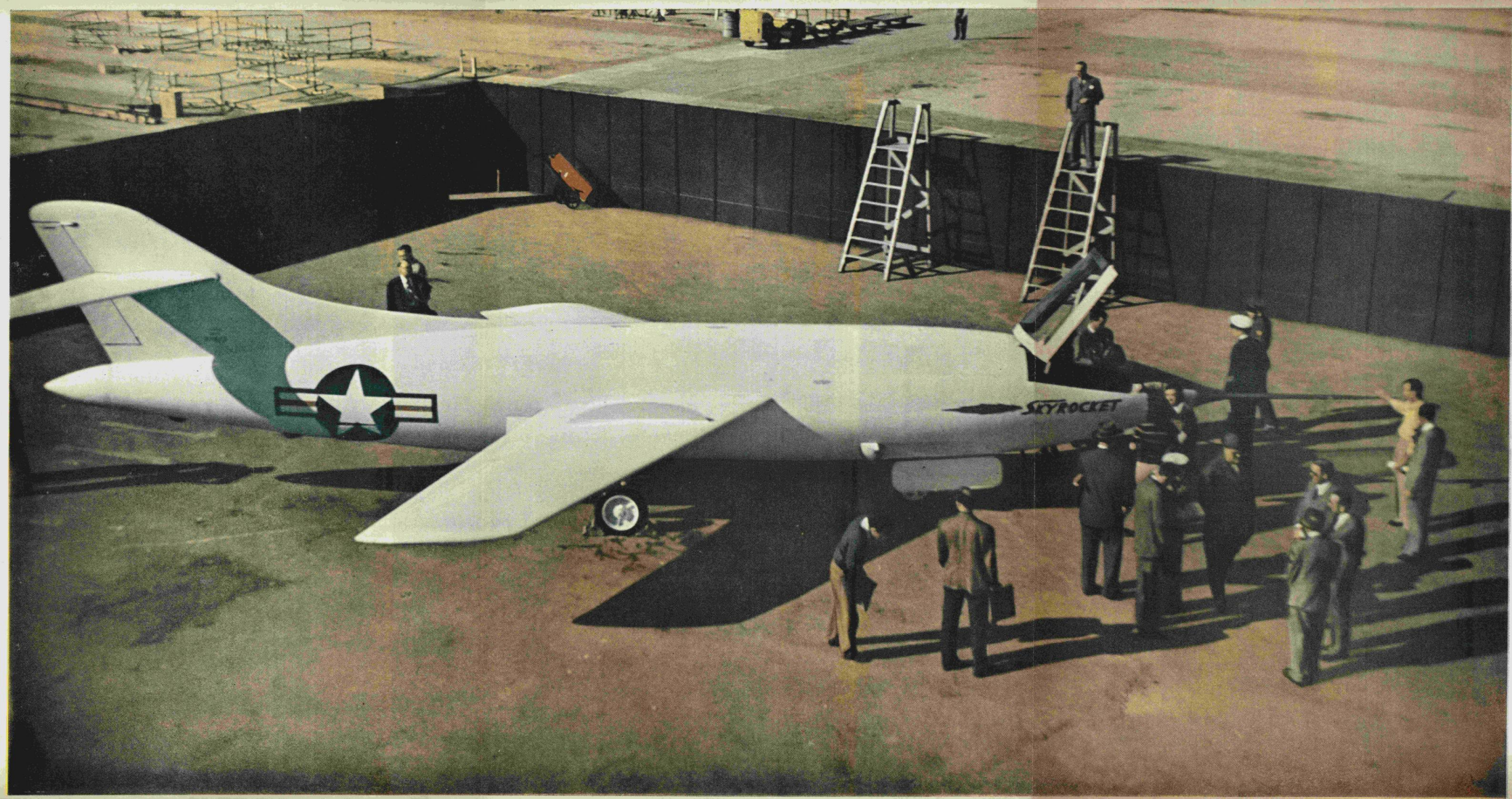
The Skyrocket, built by Douglas for the Navy and ready for its test paces by NACA pilots flying from the AAF's Test Center at Muroc Dry Lake on the California desert, had not been flown when these lines



● In emergency, a jettisonable cockpit protects the pilot after its release until a safe speed for parachuting has been reached.

were written. Although tests will be conducted at various altitudes and conditions of flight, a typical test run will see the airplane take off with only the turbo-jet in operation and climb to 25,000 (Turn to page 90)

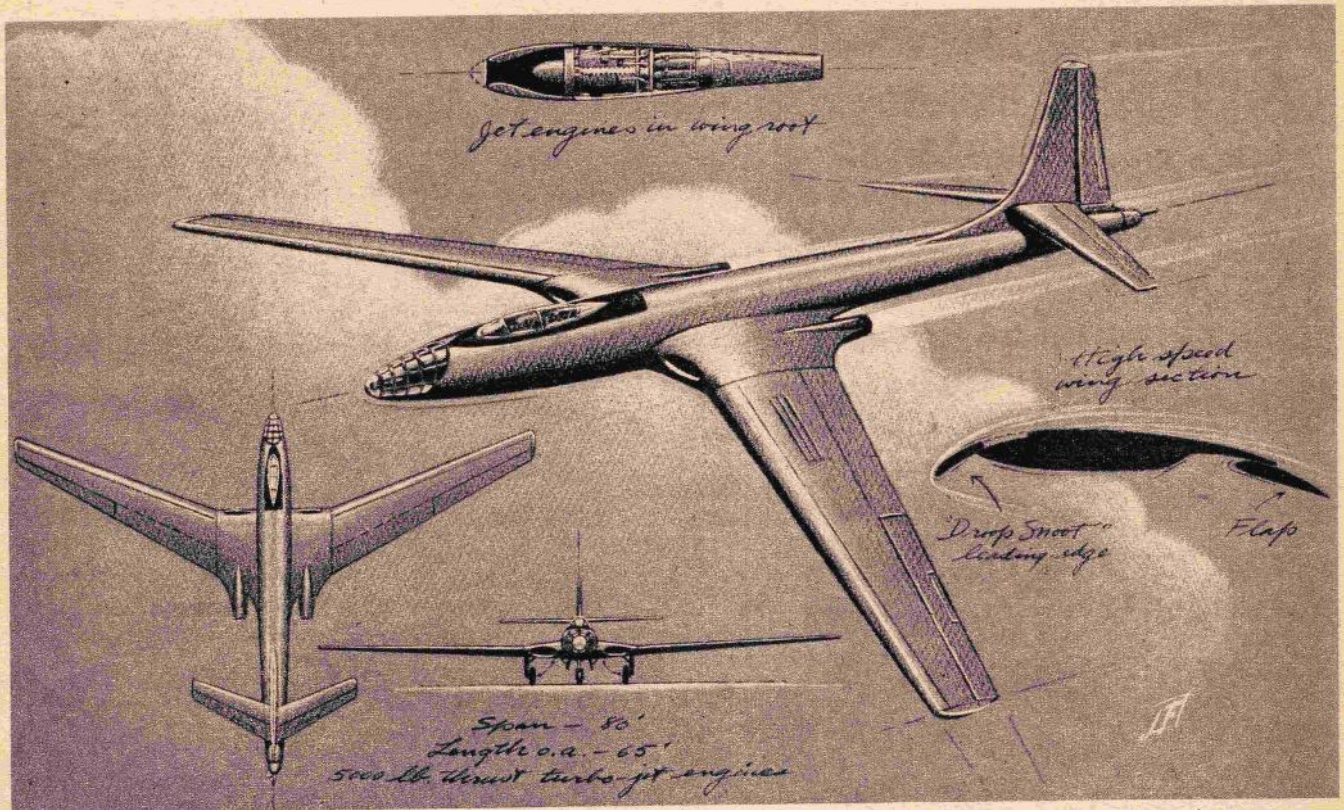




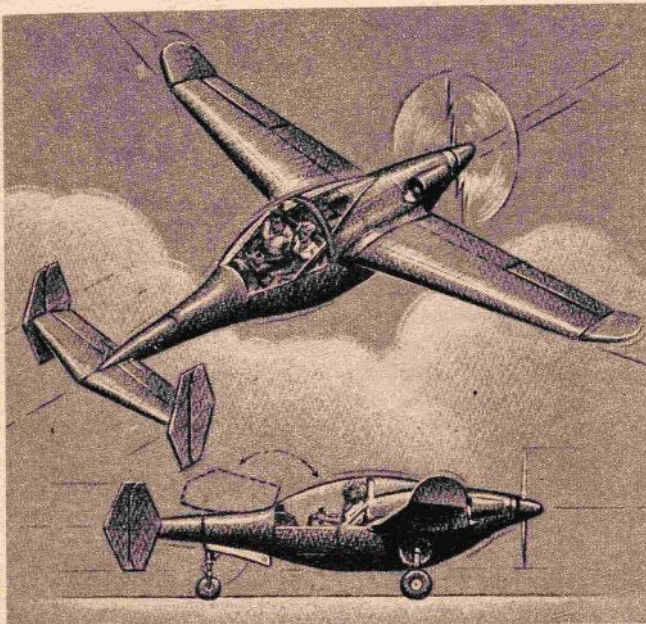


# AIRMEN OF VISION DESIGN COMPETITION

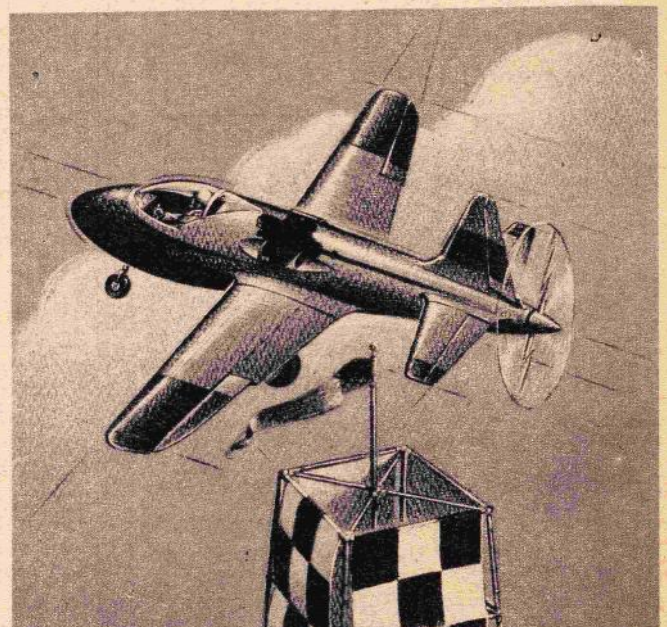
See rules on page 76



● A jet bomber with swept forward wing. May look gruesome, but this wing shape has a distinct advantage in high speed airplanes as it is more stable laterally than the swept back configuration, does not suffer excessively from tip stalls, and does not need tip slots. \*Bomb load can be carried directly on CG. Note high speed airfoil.

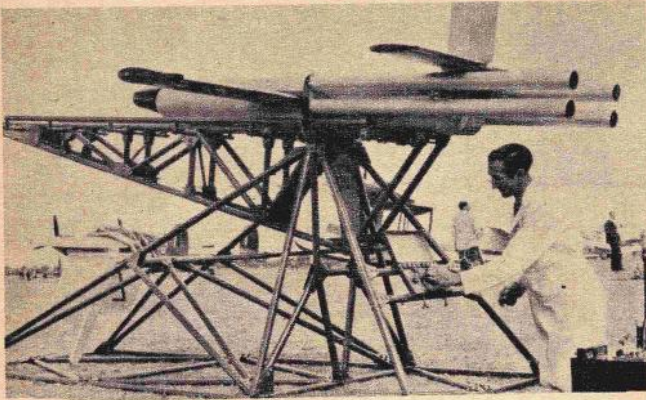


● Canard type personal plane. Tail-in-front airplanes are not new. The Wright brothers' machine was one. The location of tail surfaces offers numerous advantages, as the tail does not ride in the wake of the wing. Stall characteristics of the Canard are good too, as the tail stalls ahead of the wing.



● Here's an idea for a clean Goodyear Trophy midjet. Location of the propeller considerably reduces drag caused by the slipstream swirling past the fuselage. The location of the engine behind pilot also adds to streamlining. The 85 hp powerplant is cooled by fan which draws air through small duct.

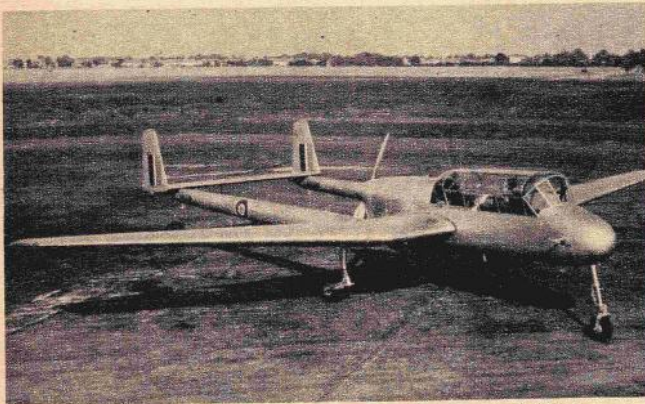




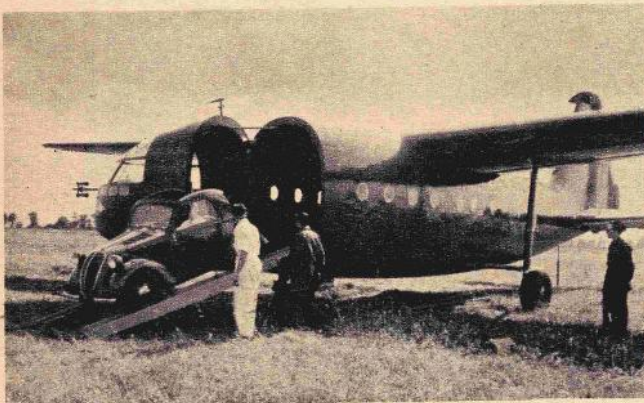
● British radio-controlled missile built by Fairey Aviation Co. Weight 720 lbs. Speed 500 mph. Rockets give 6000 lbs. thrust.



● Sikorsky S-52, two-place helicopter featuring all metal rotor blades, has been licensed by the CAA for day and night flying.



● Britain's Flying Observation Post, the Heston A.2/45 is to be used for artillery spotting. It is powered by a 240 hp Gypsy.



● French Castel-Maubussinn CM 10 cargo glider of all-wood construction. Gross weight is 7 tons, useful load is 8800 lbs.



● Percival Premitice three-place trainer, carries two students to accelerate instructions. Powered by a 250 hp Gypsy engine.



● Latest military glider, the Chase XCG-18 Aviatruk. Equipped with rear cargo ramp, has load carrying capacity of 8000 lbs.



● Equipped with dual controls for training, the Air Force's Bell YR-13 helicopter joins the Navy under the designation HTL-1.



# AIR TRAILS



JANUARY 1951

25 CENTS



## Midget Air Racing Roundup

Read Bill Brennand's "How I Won The Goodyear"



# AIR TRAILS

JAN., 1951 • VOL. XXXV, No. 4

All communications to the Air Trails editorial offices should be addressed to Air Trails, 122 East 42nd St., New York 17, N. Y.

## IN THIS ISSUE:

|                                                 |    |
|-------------------------------------------------|----|
| Cover: Douglas AD-2 . . . S. C. Smith           | 1  |
| Air Notes . . . . .                             | 10 |
| Supersonic Props . . . . .                      | 12 |
| Airmen of Vision . . . . .                      | 14 |
| Showcase . . . . .                              | 16 |
| Sailplane Parade . . . . .                      | 19 |
| Grumman Panther . . . . .                       | 21 |
| United Nations Air Force . . . . .              | 22 |
| Girl vs. Airplane . . . . . Betty Skelton       | 25 |
| How I Won the Goodyear                          |    |
| Bill Brennan                                    | 26 |
| Air Progress: Naval Air Service                 |    |
| Story—Part 2 . . . . . Doug Rolfe               | 28 |
| Ultra-Lights of England C. B. Colby             | 30 |
| Development Highlights . . . . .                | 32 |
| Tiny Turbo-Props . . . . .                      | 34 |
| Job in Aviation: Maintenance Man                | 35 |
| International Stunt Winner                      |    |
| Harold Reinhart                                 | 36 |
| Dope Can . . . . . "Dopester"                   | 39 |
| Little Twister . . . . . Frank Ehling           | 40 |
| Quarter Soarers . . . . . Henry R. Jex          | 42 |
| Semi-Scale Bellanca . . . . . Cristo Russo      | 44 |
| Sketchbook at Nats . . . . . H. A. Thomas       | 48 |
| Sopwith Dolphin . . . . . V. R. Manfredi        | 50 |
| Motor of the Month: Veco 29 . . . . .           | 52 |
| Some Glow Hot and Some                          |    |
| Glow Cold . . . . . Walton Hughes               | 54 |
| Model of the Month: Hell Razor . . . . .        | 56 |
| Mini-Speedster . . . . .                        | 58 |
| HP = K (V) <sup>3</sup> . . . . . Paul McIlrath | 71 |
| Air Trails Index—1950 . . . . .                 | 72 |
| Air Briefs . . . . .                            | 88 |

Editor . . . . . Albert L. Lewis  
 Art Director . . . . . W. F. Tyler  
 Technical Editor . . . . . Alexis Dawyoff  
 Editorial Production . . . . . Carl Happel  
 Editorial Assistant . . . . . Rose Borello

## STREET & SMITH PUBLICATIONS, Inc.

President . . . . . Gerald H. Smith  
 Vice President . . . . . Henry W. Ralston  
 Vice President . . . . . Ralph R. Whitaker, Jr.  
 Vice President and Secretary . . . . . Arthur P. Lawler  
 Treasurer . . . . . Thomas H. Kaiser  
 Walter J. McBride, Advertising Mgr., 122 E. 42nd St., New York 17, N. Y.  
 Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1, West Coast Office, 903 Garfield Bldg., Los Angeles 14, California.

• AIR TRAILS published monthly by Street & Smith Publications, Inc., at 122 East 42nd St., New York 17, N. Y. Entered as second class matter, at the post office at New York, N. Y. Authorized as second class mail, Post Office Dept., Ottawa, Canada. Copyright, 1950, by Street & Smith Publications, Inc. 25¢ per copy—\$2.50 per year. \$2.75 per year in countries of the Pan-American Union; \$3.00 per year in Canada; \$3.25 per year elsewhere.

• Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us.

• Subscription correspondence should be addressed to Subscription Dept., P. O. Box 235, Cooper Station, New York 3, N. Y.

• All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage. Printed in the U. S. A.

## THE READERS WRITE:

**Hawker Super-Fury vs. Bayle's Gee Bee . . .** I was very pleased with a recent issue except for one thing. You had a picture of the Hawker Super-Fury stating that it was the fastest plane of its time with a top speed of 252 mph.

The fastest plane of this era was Bayle's Gee Bee Special. In the Thompson Trophy Race at Cleveland in 1931 it averaged a speed of 267.342 mph in four dashes over the field. In one of these dashes it had an official American speed record of 280 mph.

So you can see this tops the Super-Fury by quite a margin!

Jim Belknap, Syracuse, N. Y.

• The Gee Bees were specialized aircraft built entirely for racing. What we meant in our Hawker caption was that the Fury was the fastest service type fighter of its day.

**Pilots Who Wear Glasses . . .** I would like the following information to settle an argument. Can one who wears glasses get a pilot's license? Also give me some information on the small Cub J-3.

A. McLaughlin, Industrial Farm, Burwash, Ont., Can.

• A pilot may wear glasses provided his visual acuity in either or both eyes is not less than 20/50 and that corrective lenses bring it up to 20/20.

The J-3 Cub is a two-place lightplane manufactured by Piper Aircraft Corp. of Lockhaven, Pa. It is powered by a 65 hp four-cylinder air-cooled engine. Span is 35 ft. 4 in., top speed 90 mph.

**Such Name Calling!** . . . Now and then we see pictures and articles describing interesting little rotary wing aircraft whose airfoils are powered by ram-jets attached to their extremities.

Seems to me Uncle Sam might be able to find a good job for them if they could attract enough of his attention, and I thought interest might be stimulated by providing them with a suitable name.

It is not an ornithopter but a little helicopter with which someone has combined the atoid; it's a mighty slick creation but it lacks a designation, so why don't we call the thing the HELIDYD?

Glenn R. Stephens, Glendale, Calif.

**Depends on Us . . .** I like your magazine very much. The "Dopester" must be quite a card! I depend on your tests regarding Motor and Model of the Month before buying anything. I also like the section on "Your Job in Aviation" as I intend to be an aeronautical engineer and I am entering University next year to study for same.

Thomas Wallace, Granum, Alberta, Can.

**Citation for Stunt . . .** Been reading Air Trails since 1946 and find it a very interesting magazine. I fly just one nice stunt ship and that's the Triumphant. I'm hoping you'll get out more stunt ships like it. Yes, I know scale jobs are beautiful but I still like stunt. Right now I'm in Korea and haven't got much time to build planes, but am still reading AT. Nothing will stop me from that. Can't you get out more stunt ships?

Cpl. S. Aya, HQ Battery, 64th F.A. Bn., APO 25, c/o PM, San Francisco, Calif.

• See this issue, Cpl.!

**Pitts Special . . .** In studying the plans of the Pitts Special fairly carefully in your magazine, and three-views of the same ship in other mags, I noticed a difference in the shape of the elevators between the two plans. Also, the upper wing on your ship seems to be set slightly higher. Is this an error on your designer's part or were there more than two different designs of the real ship?

Robert Neulin, Hellertown, Pa.

• Our 3-views of the Pitts were scaled di-

rectly from the plane and we consider them entirely accurate.

**Who's Claude's Stand-in? . . .** It's a fine shot and a fine plane which you attributed to me in the caption under one of the pictures in the recent photo feature on the '50 Nationals—but that's not me! Proof positive lies in the fact that the job does not bear mah Triple-Bar brand, podner. And last but not least, I just love ROG since you get a 5-second bonus and ROG'ed all my officials at the Nats.

Will wear a propeller beanie next year for positive spotting through AT's camera viewfinder.

Look for me at radio-control, for free flight is getting too hectic for an old man like me.

Claude McCullough, Ottumwa, Iowa



Photo of "Claude" in Nov. 1950 issue

**Delanne Questionnaire . . .** I enjoy your magazine so much I can hardly wait to get the next issue. In a recent one containing the article on "Delanne and His Duo-Mono-planes" I was wondering if the plane would fly as well or better with the wings just opposite. The top wing would be on bottom and the tail set would be on bottom. If it wouldn't work I would like to have explained why.

Richard Bannon, Plain Dealing, La.

• We would say no—since the slot effect, created by the present method, would disappear.

. . . I've wanted to build a small plane for some time, but don't want to wind up with a "home-built Cub." To me the Duo-Mono-plane offers possibilities. So can you help me in obtaining more technical aerodynamic information? I would specifically like to buy a publication of Delanne's design if it is available.

W. M. Burkitt, Bakersfield, Calif.

• All patents on the Delanne configuration are owned by the Pardel Development Corp. of New York City, and information regarding its aerodynamics and other details are not available to individuals.

. . . I noticed that Delanne's plane has a resemblance to Mignet's Flying Flea. Mignet is also French.

Pfc. Salvatore Fiorentino, Fort Bragg, N. C.

• Yes, superficially Mignet's Flying Flea does somewhat resemble the Delanne Duo-Monoplane. The difference, however, is in the aerodynamics, which not only greatly increase the lift of the Delanne wings but also greatly reduce the drag of the aircraft.

**Wee Bee Model . . .** We certainly want to express our thanks to you for the explicit presentation of the article by Lloyd V. Hunt on our airplane the Wee Bee. Mr. Hunt did an excellent job of reproducing our airplane as a free flight and U-control model.

K. S. Coward, Ken S. Coward & Associates, San Diego, Calif.

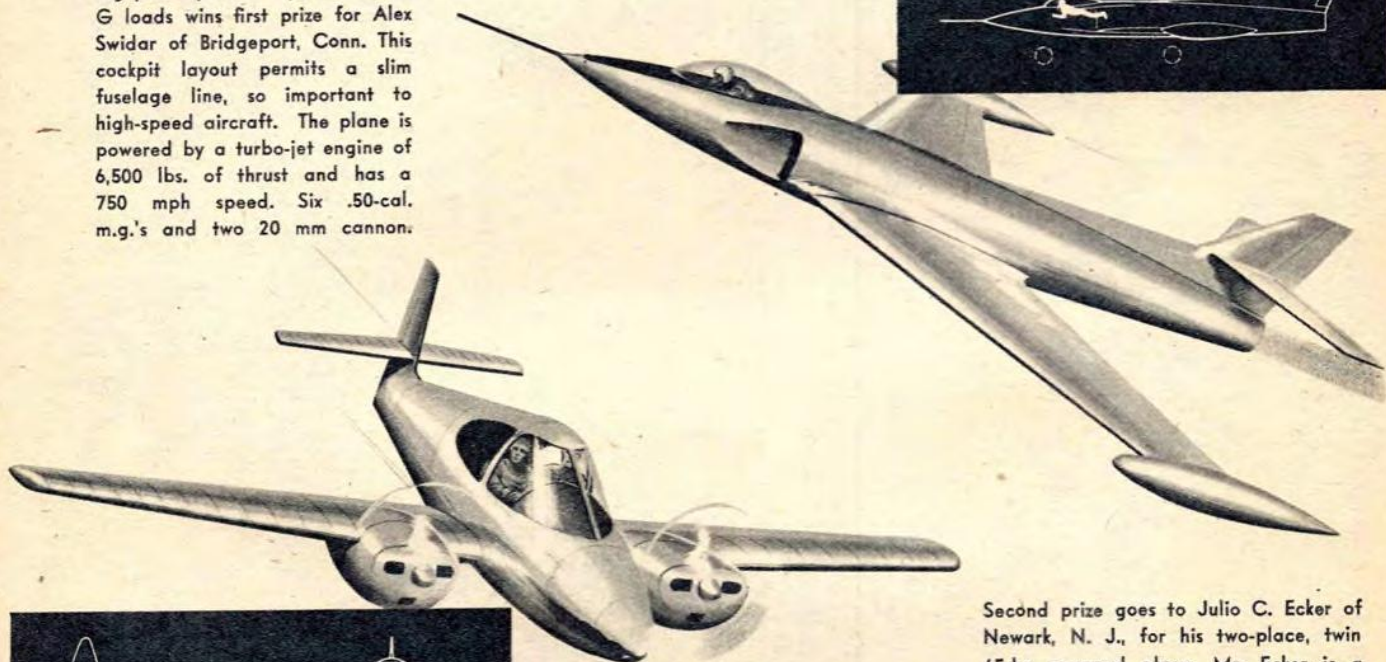
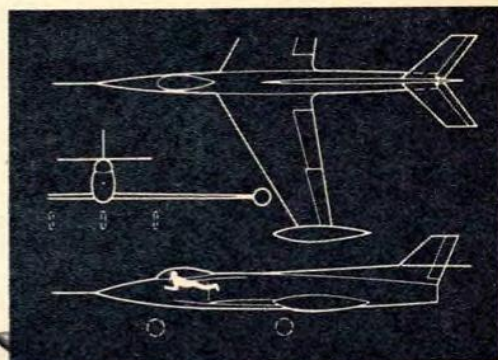
(Continued on page 9)



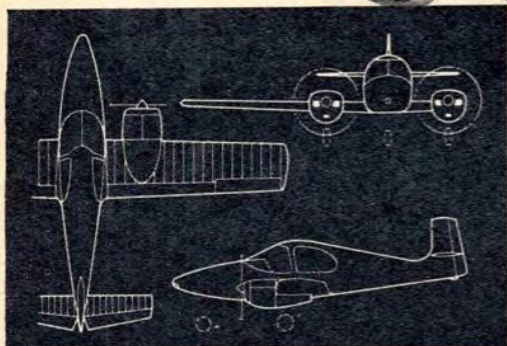
# Airmen of Vision

## DESIGN COMPETITION

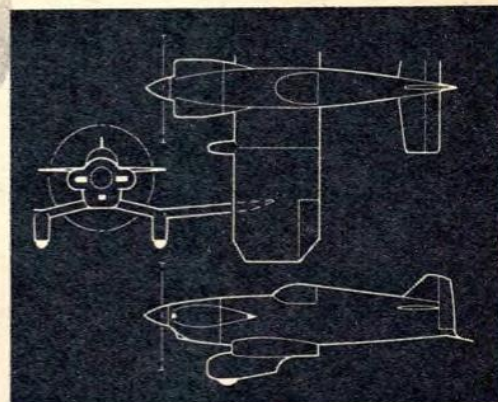
A supersonic interceptor featuring prone pilot cockpit to reduce G loads wins first prize for Alex Swidar of Bridgeport, Conn. This cockpit layout permits a slim fuselage line, so important to high-speed aircraft. The plane is powered by a turbo-jet engine of 6,500 lbs. of thrust and has a 750 mph speed. Six .50-cal. m.g.'s and two 20 mm cannons.



Second prize goes to Julio C. Ecker of Newark, N. J., for his two-place, twin 65-hp personal plane. Mr. Ecker is a private pilot and has very definite ideas as to his preference in private planes. This one, designed to do 135 mph, is eminently suitable for instrument flying. Plane is all metal, with wing structure similar to that of a Republic Seabee, consisting of three spars with corrugated skin riveted to them. The span is 32 ft.



A midget racing plane brings third prize to Earl S. Mathis of Granite City, Ill. The little speedster features an inverted gull wing. This wing shape permits good juncture at fuselage with minimum of fairing as well as smaller and cleaner landing gear which actually consists of wheel pants, eliminating drag-producing legs. Span is 16 ft., length 15½ ft. Speed 200 mph. Engine of 85 hp and 190 cu. in. displacement provides power.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 122 E. 42nd, New York. The editors regret that because of large number of entries they cannot enter into correspondence on Airmen of Vision.



# AIR TRAILS

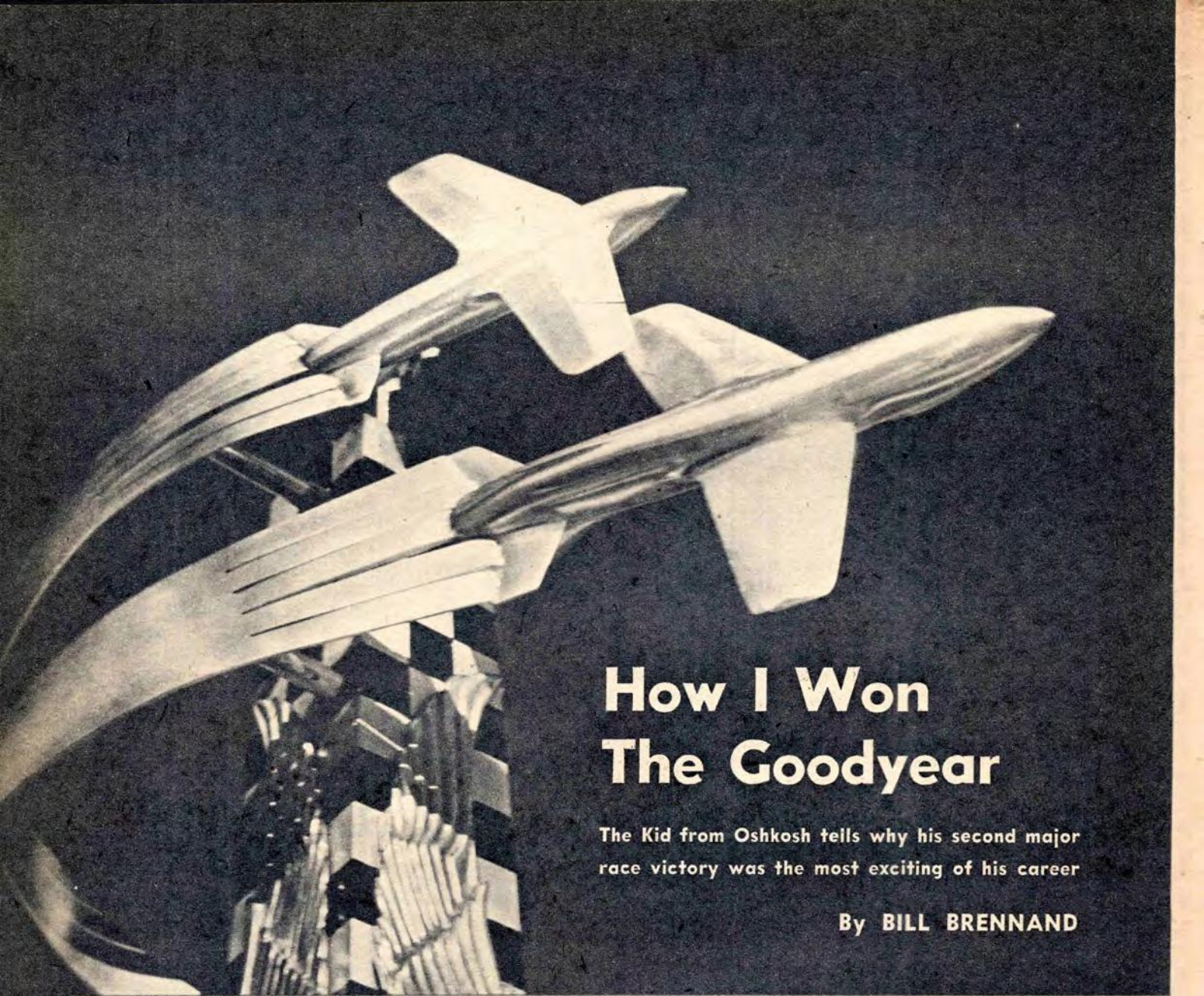
JAN., 1951



**HIGH, WIDE AND MIGHTY CLOSE:**

An Air-Pix of the Grumman Panther by air-photog Harold Martin





# How I Won The Goodyear

The Kid from Oshkosh tells why his second major race victory was the most exciting of his career

By BILL BRENNAND



Two-time winner of the Goodyear race, Brennan also captured Continental Motors trophy (above)

■ It is a nice warm summer day in August. Two midget planes from the small town of Oshkosh, Wis., take off and disappear into the Southwest. Their pilots: Steve Wittman in one and myself in the other. Our destination: the National Air Races; our objective: the Goodyear Trophy. It isn't an easy objective as we both very well know, although I did make a successful try at it in my first race, back in 1947.

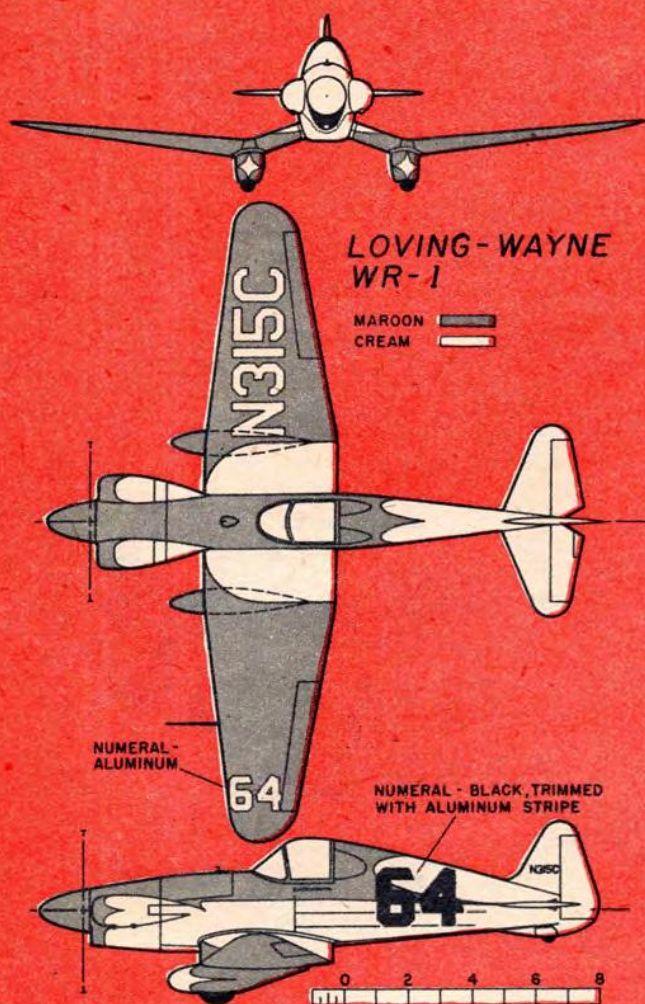
As my tiny craft slips serenely along over the scattered cottonlike clouds I settle comfortably down in

the snug cockpit. I glance over at the sleek lines of the bright yellow Bonzo flying alongside. My thoughts wander off to the adventure we are swiftly approaching. I think of the other pilots I know, Tony LeVere, Herman Salmon (Herman won the year before), and Pitts from Florida. I wonder what the newcomers will come up with this year.

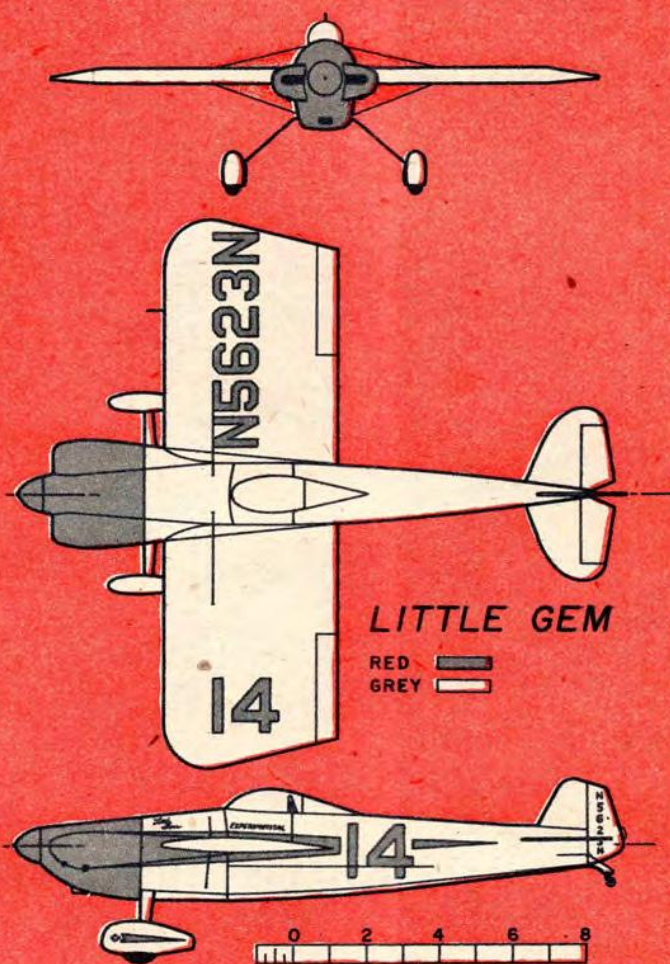
It's funny how you feel about your chances of winning. Sometimes I'd think, "We don't have a chance" and sometimes I'd think, "We can't be beaten." Right now



## More competition, Bill: one new, one revamped midget



**Loving Special.** Designed by Neal Loving of Detroit, Mich. Span 20 ft., length 17 ft. 6 1/4 in. Was completed in 1950. The inverted gull wing permits use of lower landing gear, gives better fairing.



**Miller Special.** Has participated in a number of races, but was recently modified. Complete new wing and tail group, cleaner fuselage and a bubble canopy. Span is 15 ft. and length 17 ft.

I'm feeling pretty good. Looking over at Bonzo gives me a hopeful feeling. We worked hard on the little yellow monster most of the summer, and we really have it moving, too. Buster, my poor little red plane, has received practically no attention because of the concentrated work on Bonzo. Buster is due for a remodeling after this race. However, I would be more than content with second this time—if we may be so fortunately blessed, but anything can happen in an air race. . . .

The weather is nice all the way

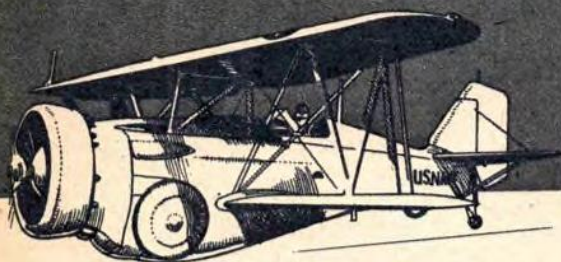
and we soon find ourselves over the huge Cleveland municipal airport, the setting for the great event. As we circle the field I move in, even closer to Bonzo. Nothing like making it look good to those on the ground. A short traffic pattern, a green light from the tower and the two ships settle softly down on the long runway, never varying from their tight formation. We roll quickly toward the Air Force hangar, anxious to see our old racing buddies, many of whom we encounter only once or twice a year, at these events. As we coast

up to the busy hangar a large number of people come from various planes. We open the canopies and greet them—Bill Robinson, Bob Downey and Keith Sorenson from the West Coast, and there's Earl Ortman. He's going to need crutches pretty soon, but he still flies. We chat freely for a while exchanging news and rumors and airing the ever-present gripes that accumulate.

Almost unnoticed, our crew has (Continued on page 64)



# Air Progress



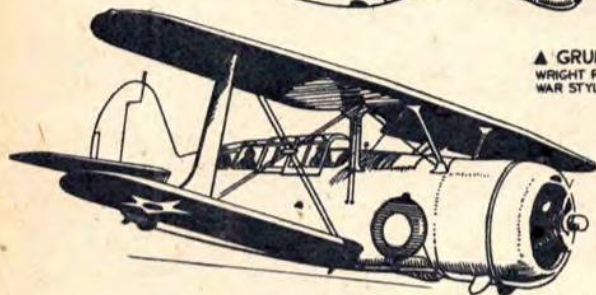
▲ CURTISS F11C-3 700 H.P. WRIGHT CYCLONE. TYPICAL 1933 NAVY FIGHTER



▲ GRUMMAN F3F-3 1000 H.P. WRIGHT RADIAL ENGINE. TYPICAL PRE-WAR STYLE MARINE CORPS FIGHTER



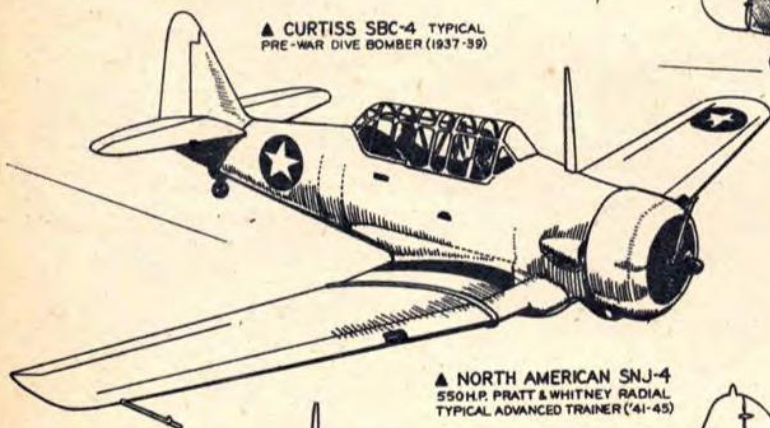
◀ GRUMMAN SF-1 TYPICAL PRE-WAR SCOUT-BOMBER



▲ CURTISS SBC-4 TYPICAL PRE-WAR DIVE BOMBER (1937-39)



STEARMAN N2S-5 220 H.P. ▲ LYCOMING ENGINE. A PRE-WAR DESIGN BUT WIDELY USED THROUGHOUT THE WAR AS A PRIMARY TRAINER



▲ NORTH AMERICAN SNJ-4 550 H.P. PRATT & WHITNEY RADIAL. TYPICAL ADVANCED TRAINER ('41-45)



TIMM TUTOR (N2T-1) 220 H.P. ▲ CONTINENTAL ENGINE. PRIMARY TRAINER



▲ CURTISS SNC-1 420 H.P. WRIGHT WHIRLWIND ENGINE. — ADVANCED TRAINER



CURTISS SOC-3 TYPICAL CATAPLANE  
◀ SPOTTER PLANE IN GENERAL SERVICE AT START OF WAR...



▲ CURTISS SEAHAWK (SC-1) IMPROVED CATAPLANE SPOTTER DESIGN INTRODUCED DURING THE GLOBAL WAR

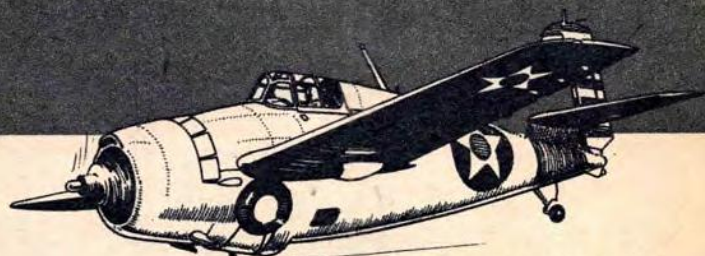
The U. S. Navy air arm, already strong before 1941, was rapidly strengthened when the global nature of World War II became apparent. Naval aircraft, originally intended to serve as an extension of eyesight for ship gunners, actually became in this war an extension of the guns themselves. In the battles of Midway and the Coral Sea no capital ships were engaged, and the major portion of the fight was borne by aircraft either land-based or operating from carriers. Furthermore, the naval air arm took care of sea rescue work all through the years of World War II.

Types illustrated here cover merely a few of the numerous aircraft procured by the Navy Air Service during

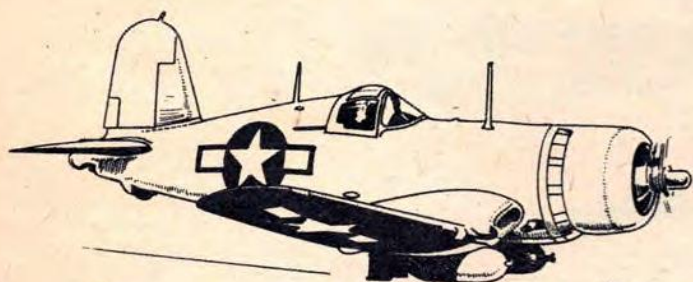


# Naval Air Service Story

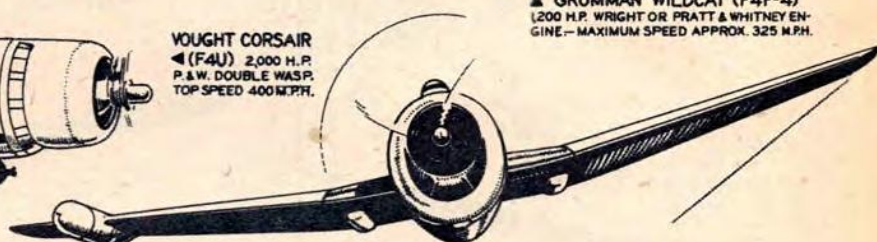
PART 2—By DOUGLAS ROLFE



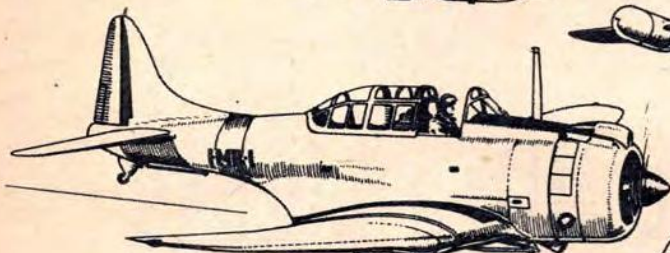
▲ GRUMMAN WILDCAT (F4F-4)  
1,200 H.P. WRIGHT OR PRATT & WHITNEY EN-  
GINE—MAXIMUM SPEED APPROX. 325 M.P.H.



VOUGHT CORSAIR  
▲ (F4U) 2,000 H.P.  
P. & W. DOUBLE WASP.  
TOP SPEED 400 M.P.H.



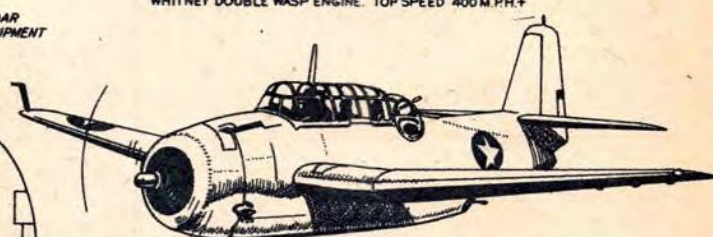
▲ GRUMMAN HELLCAT (F6F) 2,000 H.P. PRATT &  
WHITNEY DOUBLE WASP ENGINE. TOP SPEED 400 M.P.H.+



DOUGLAS DAUNTLESS (SBD) 950 H.P. ▲  
AND (LATER) 1,200 H.P. RADIAL A/C ENGINES. —  
OBSOLETE IN 1941 IT NEVERTHELESS MADE  
HISTORY THROUGHOUT THE COURSE OF THE WAR

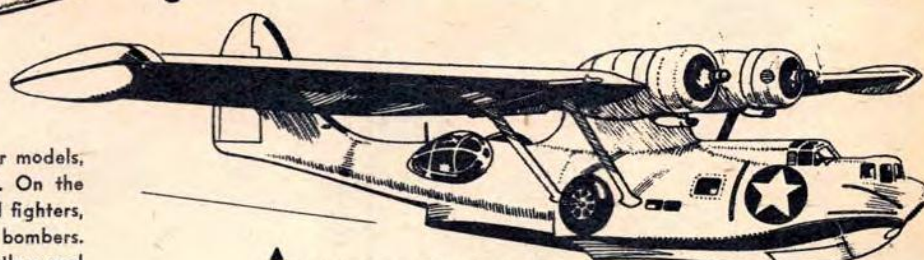


CURTISS HELLDIVER (SB2C-1 to 4) ▲  
1,700 H.P. WRIGHT CYCLONE RADIAL ENGINE

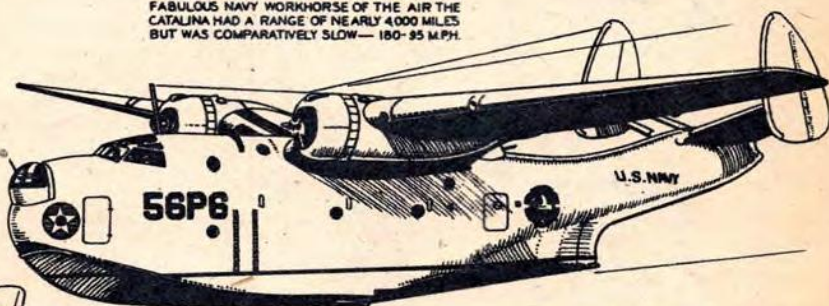


▲ GRUMMAN AVENGER (TBF) 1,700 H.P. WRIGHT  
CYCLONE ENGINE—THIS TOUGH SHIPBOARD STRIKE BOM-  
BER CARRIED A REGULATION FULL-SIZE NAVY TORPEDO

DOUGLAS  
ROLFE

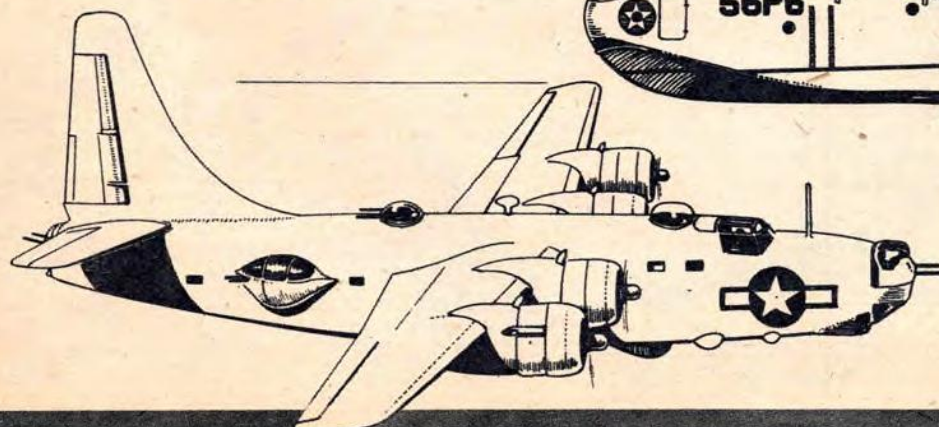


▲ CONSOLIDATED CATALINA (PBY-5A)  
TWO 1,200 H.P. PRATT & WHITNEY TWIN WASPS.  
FABULOUS NAVY WORKHORSE OF THE AIR THE  
CATALINA HAD A RANGE OF NEARLY 4,000 MILES  
BUT WAS COMPARATIVELY SLOW—180-95 M.P.H.



▲ MARTIN MARINER (PBM-3) TWO 1,600 H.P.  
WRIGHT RADIAL ENGINES — LIKE THE CATALINA  
THIS LARGE PATROL BOMBER WAS A PRE-WAR DESIGN

◀ CONSOLIDATED PRIVATEER (PB4Y-2)  
LAND-BASED HEAVY PATROL BOMBER — FAMILY RE-  
SEMBLANCE TO THE ARMY LIBERATOR IS STRIKING  
BUT ACTUALLY, APART FROM THE HIGH-LIFT DAVIS  
WING, THIS WAS A COMPLETELY DIFFERENT DESIGN



the war. The left-hand page shows a few prewar models, typical trainers and a couple of fleet spotters. On the right-hand page are displayed typical shipboard fighters, dive and torpedo bombers and heavy patrol bombers. Many of these ships, notably the Douglas Dauntless and the Consolidated Catalina, were of prewar design. The Dauntless, regarded as obsolescent at the time of Pearl Harbor, hung up an impressive battle record. More than 5,000 of these supposedly second-line airplanes were delivered to the Navy during the war.

(No attempt has been made to cover lighter-than-air aircraft or aircraft carriers which of course played an important role in the Navy's war effort.)



# Development Highlights



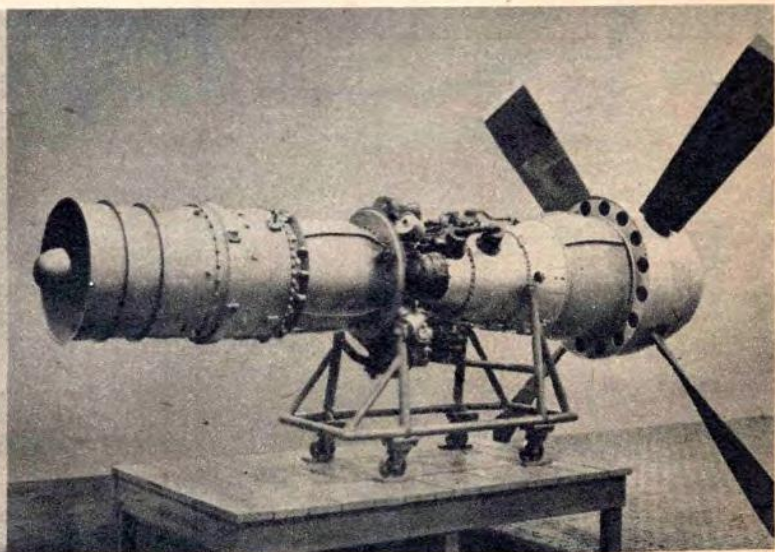
**RB36D Reconnaissance Bomber.** Its mission will be to seek and bring back facts on enemy targets. Equipped with power cameras.



**Augusta CP-110**, a new Italian personal plane, is in class with early models of the Navion. Plane is of all-wood construction and powered by a 145 hp Alfa engine. Speed 170 mph.



**Seibel S-4** helicopter. Cargo and passenger compartment and fuel tanks located at center of lift for better balance under different load conditions. Craft's engine is a 125 hp Lycoming.



**Turbo-Wasp T-34.** Designed and built by Pratt & Whitney Aircraft, this turbo-prop engine is said to be the most powerful in the world. Basic weight is 2500 lbs. Develops more than 5000 hp.





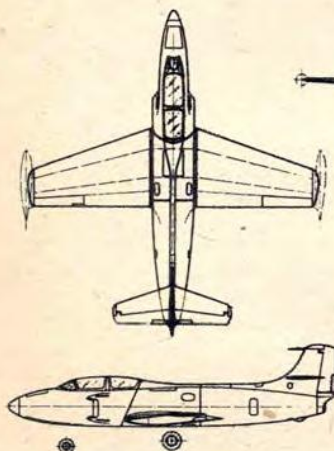
**More reach** is given to the North American B-45 Tornado bomber with these wing tanks whose normal range is around 800 miles. Note stabilizing fins on tanks. The pay load is over 10 tons.



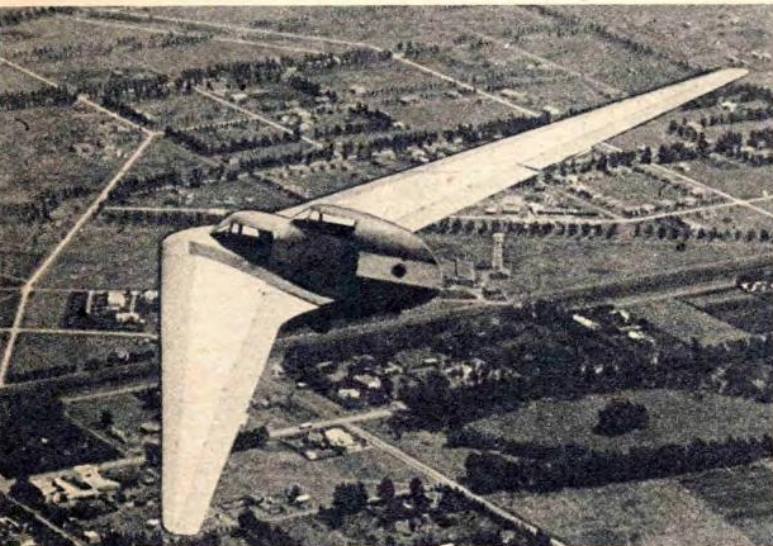
**Canadian Sabre.** The first of 100 Canadian-built F-86s, manufactured by Canadair Ltd. of Montreal. This model is powered by the U. S. made General Electric J-47 jet engine; subsequent aircraft will have the Canadian Avro Orenda of 7200 lbs. thrust.



**Brazilian** single-place lightplane, the Bichinho I.P.T.O. designed by Institute of Technical Research to test qualities of national materials. It has a top speed of 130 mph.



**Fiat G-80.** Italy's first postwar jet plane. Designed as 2-place trainer. Prototype is powered by British DeHavilland Goblin of 3500 lbs. thrust. Future models will have the more powerful R.R.Nene. Top speed 547 mph, rate of climb 5120 ft/min., gross weight totals 11,000 lbs.



**Glén Antu** (Sun Ray), an unusual-looking flying wing sailplane developed by the Aeronautical Institute of Argentina, designed by one of Germany's famous Horton brothers. Span is 59.04 feet.



**YH-23.** Military version of the very popular Hiller 360 helicopter recently purchased by the Air Force for use by the Army Ground Forces. Craft also carries ambulance installation.



# AIR TRAILS<sup>®</sup>

25 CENTS

FEBRUARY 1951



## MEET AMERICA'S AEROBATIC CHAMP

How's Your Air I. Q.?—See Page 24



# AIR TRAILS

FEB., 1951 • VOL. XXXV, No. 5

All communications to the Air Trails editorial offices should be addressed to Air Trails, 304 East 45th St., New York 17, N. Y.

## IN THIS ISSUE:

|                                |                   |    |
|--------------------------------|-------------------|----|
| Cover: Fairchild XC-120        | S. C. Smith       | 1  |
| Showcase                       |                   | 10 |
| Airmen of Vision               |                   | 14 |
| Air Notes                      |                   | 16 |
| Solo Club                      |                   | 18 |
| Hey, Joe—Give a Look!          |                   | 21 |
| Rainmaking Is My Business      |                   |    |
| C. S. (Chuck) Barnes           |                   | 22 |
| How's Your Air I.Q.?           |                   | 24 |
| Flight Questions               |                   |    |
| Everett Greenbaum & Stu Hample |                   |    |
| Twelve Guesses                 | Shorzo Ave        |    |
| Nine Chances                   | Aubrey Kochman    |    |
| Rod's Red Hot                  | John L. MacKenzie | 26 |
| Air Progress: Blackburn Story  |                   |    |
| Doug Rolfe                     |                   | 28 |
| Development Highlights         |                   | 30 |
| B-47: From Birth to Battle     |                   | 32 |
| Job in Aviation: Dispatcher    |                   | 34 |
| Oil Slippery                   | S. Calhoun Smith  | 35 |
| Wire-less Report               | H. A. Thomas      | 39 |
| Dope Can                       | "Dopester"        | 40 |
| Li'l Lightning                 | Walton Hughes     | 42 |
| Unliner                        | Aubrey Kochman    | 44 |
| Boulton Paul P. 111            | Björn Karlstöm    | 48 |
| You Can Chrome-Plate Pistons   |                   |    |
| C. O. Wright                   |                   | 48 |
| Javelin Glider                 | Ray Jessop        | 50 |
| Model of Month: Little Mustang |                   | 52 |
| Motor of Month: Cub .039       |                   | 54 |
| Sketchbook                     |                   | 56 |
| Record Review                  |                   | 58 |
| New Wakefield Rules            | R. H. Warring     | 60 |
| Western Round-up               | Dick Everett      | 62 |
| Editor                         | Albert L. Lewis   |    |
| Art Director                   | W. F. Tyler       |    |
| Technical Editor               | Alexis Dawydoff   |    |
| Editorial Production           | Carl Happel       |    |
| Editorial Assistant            | Rose Borella      |    |

## STREET & SMITH PUBLICATIONS, Inc.

President.....Gerald H. Smith  
Vice President.....Henry W. Ralston  
Vice President.....Ralph R. Whitaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser  
Walter J. McBride, Advertising Mgr., 122 E. 42nd St., New York 17; Frank C. Smith, Mid-Western Adv. Mgr., 230 N. Michigan Ave., Chicago 1; West Coast Office, 903 Garfield Bldg., Los Angeles 14, California.

• AIR TRAILS published monthly by Street & Smith Publications, Inc., at 122 East 42nd St., New York 17, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail. Post Office Dept., Ottawa, Canada. Copyright, 1951, by Street & Smith Publications, Inc. 25¢ per copy—\$2.50 per year. \$7.50 per year in countries of the Pan-American Union; \$3.00 per year in Canada; \$10.00 per year elsewhere.

• Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us.

• Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y.

• All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage. Printed in the U. S. A.

## THE READERS WRITE:

**A Crew Chief Reports** . . . In regard to your explanation for the lack of P-47s in the National Air Races, I would like to add what I believe is another reason. The P-47 has often been played up as a fast 400-plus fighter, but in reality it was not a fast fighter, being an easy 100 mph slower than the P-51. I spent three or four years as a crew chief on both these types, and although the P-47D was a first-rate ground-support plane, it was no match in speed or range to the P-51 or the P-38.

Incidentally, the F-82 is not a jet, but is powered either by two Allison V-1710s or two Packard-built Rolls-Royce Merlins.

Merle C. Olmstead, Chicago, Ill.

• Sorry, that was a typographical error. We were referring to the F-89.

**Cost of Link Instructor Training** . . . The article "Link Trainer Instructor" in the November issue was a fair yarn, but on page 76 when the author asks the question, "How do you become a Link instructor?" and then answers the question, the way he gives is certainly the most difficult possible. The best way is to spend five months in the Link Trainer Instructor course at Spartan School, spending \$500 plus room and board. The way given in the article would cost about \$1,900 for a Commercial license, \$400 more for an Instrument Rating, and heaven knows how much for flying time.

Glenn O. Hopkins, Spartan School of Aeronautics

**Britain Likes** . . . We liked your drawings and article on the Curtiss Jenny—keep it up. R. C. Broune, Model Aeronautical Society, Luton, England

**S.O.S. from Denmark** . . . The motor I have is a Danish Ceros glow, but it is not a good motor. There are no ballbearings or piston rings and it turns only 5,000 to 7,000 rpm's and the weight is 8 oz.

I would like to have a motor from America, but I can't get dollars here. Please will you send me a motor? I will be very glad if you will. If you will send me a motor I would like that it should be a Cobra 45, Contestor 60, Ohlsson 23, Fox 35, Hornet 60, McCoy 29, Ohlsson 23, 33, 60, Super Cyclone 60 or Torpedo Special.

Preben Petersen, Nykobing F., Denmark

• Wish we could help you, Preben, but afraid the Marshall Plan hasn't included model motors on its list.

**Can Helicopter Lift Auto?** . . . Is it possible for a helicopter of any make or type (one that has been built) to pick up an automobile and transport it in flight?

Can a helicopter pick up loads of 3,500 to 4,000 lbs., then reach an altitude of over 1,000 ft. and transport the load for a fairly good distance?

Bernard E. Huss, Tiffin, Ohio

• We doubt that any present production helicopter can lift more than 2,500 pounds of weight exclusive of its own weight and that of crew and fuel.

Your second question is not clear. If you mean that the 3,500 lbs. of weight is to remain suspended under the helicopter during the trip, this would not be practical as the drag of the object would be very high, thus considerably slowing the machine. A similar idea was used by Howard Hughes when he developed his very large Hercules helicopter for transporting trucks, artillery and light tanks, for short hauls only. Unfortunately, the helicopter crashed, and we do not know whether the idea was abandoned by Mr. Hughes.

**No Kitting** . . . Why not sell kits of materials with your plans, strip and sheet balsa, plywood and wire.

Jan Berkhout, Brooklyn, N. Y.

• AT is not in the kit or supply business. AT plans are a supplement to the kits now available.

**Control-line Flutter** . . . As my knowledge of aerodynamics is slight, perhaps you can help me with a problem. On several of my original control-line models, there has been a tendency to flutter—not elevator flutter but an up-and-down fluctuation of the entire tail assembly. This is more noticeable at higher speeds, as in a dive.

K. C. Priest, c/o Bastrop National Bank, Bastrop, La.

• Your trouble can come from one of two sources: a loose control system, that is, too much play in pushrod mechanism, or your framework structure is too tight. In the latter case, shift to heavier wood sizes for stronger parts.

**Calling Bill Barnes!** . . . Air trails is tops with me. Is this the same mag that at one time ran the Bill Barnes Stories?

Jack B. Reed, Western Colorado Auto Racing Association, Grand Junction, Colo.

• You're absolutely right, Jack! See reproduction of cover below, dated October, 1935.



**How Fast is B-36?** . . . My friend and I had an argument on how fast does a B-36 fly. Would you straighten us out?

Bobby Tucker, Shreveport, La.

• It is claimed that the speed of the B-36 equipped with jet pods is 435 mph at 40,000 ft.

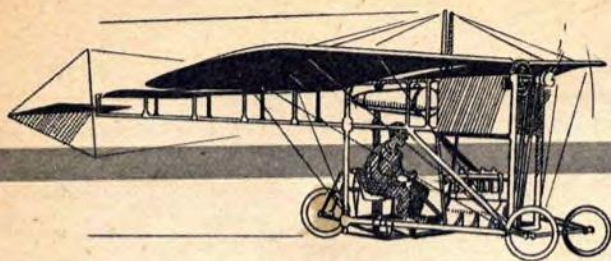
**Flying Saucer Facts?** . . . Firstly, just an appreciation of the fine job you do with Air Trails. I find it makes good reading, especially the model section.

What's the go on the flying saucers? Over here our Sunday papers are putting on a big story about these mysterious projectiles. According to the accounts given it would appear that several responsible people swear to have seen them, including the USAF. Personally I won't be convinced until they find one. How about an article in Air Trails giving facts only.

Brian T. Faulkner, Cheshire, England  
(Continued on page 9)



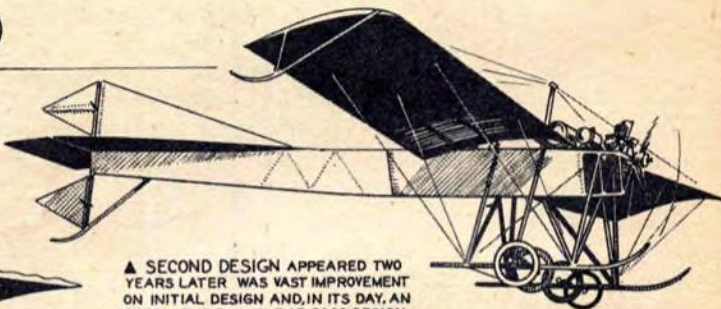
# Air Progress



▲ FIRST BLACKBURN DESIGN WAS PRODUCED IN 1909. EXACT STRUCTURAL DETAILS ARE NOT CLEAR BUT CONFIGURATION IS STRICTLY ACCURATE. THE 2-BLADED PROPELLER WAS BELT OR CHAIN-DRIVEN FROM A 4-CYL. ENGINE



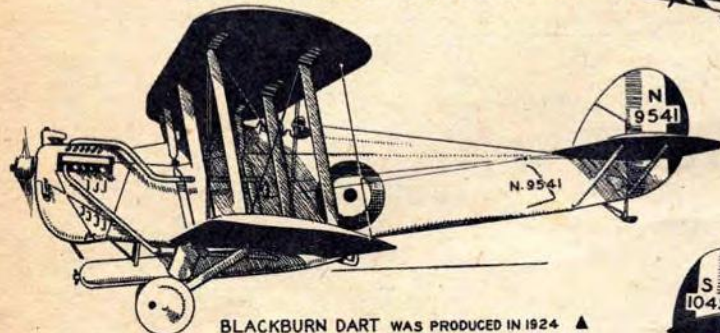
1912 BLACKBURN WAS CLEANER, MORE POWERFUL. ▲ THAN 1911 MODEL. RECENTLY THIS PLANE WAS RECONDITIONED AND FLOWN WITH THE ORIGINAL 50-H.P. MOTOR



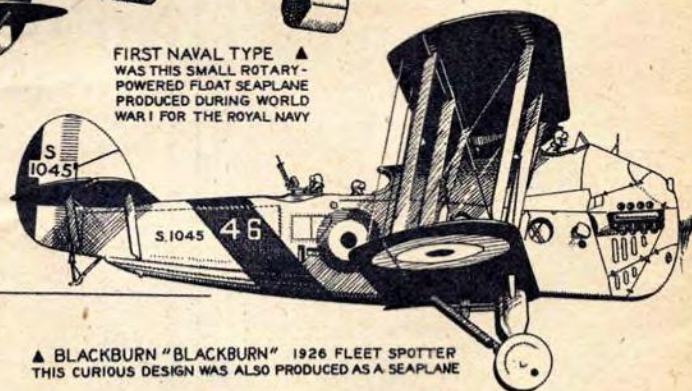
▲ SECOND DESIGN APPEARED TWO YEARS LATER. WAS VAST IMPROVEMENT ON INITIAL DESIGN AND, IN ITS DAY, AN EXCELLENT EXAMPLE OF GOOD DESIGN.



FIRST NAVAL TYPE ▲ WAS THIS SMALL ROTARY-POWERED FLOAT SEAPLANE PRODUCED DURING WORLD WAR I FOR THE ROYAL NAVY



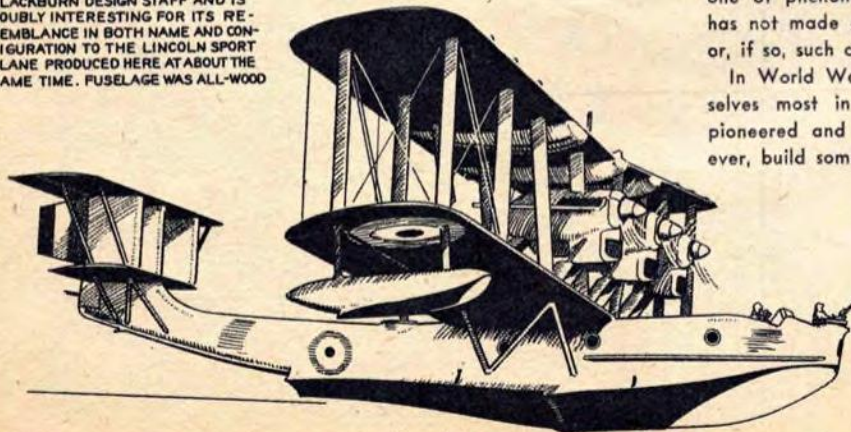
BLACKBURN DART WAS PRODUCED IN 1924. ▲ AND WAS FIRST SPECIALLY DESIGNED BLACKBURN TORPEDO-BOMBER AND FORERUNNER OF A LONG LINE OF SIMILAR AIRCRAFT. ALL FINE MACHINES



▲ BLACKBURN "BLACKBURN" 1926 FLEET SPOTTER. THIS CURIOUS DESIGN WAS ALSO PRODUCED AS A SEAPLANE



▲ BLACKBURN LINCOCK 215-H.P. RADIAL ENGINE. THIS 1928 FIGHTER INDICATES THE VERSATILITY OF THE BLACKBURN DESIGN STAFF AND IS DOUBLY INTERESTING FOR ITS RESEMBLANCE IN BOTH NAME AND CONFIGURATION TO THE LINCOLN SPORT PLANE PRODUCED HERE AT ABOUT THE SAME TIME. FUSELAGE WAS ALL-WOOD



▲ BLACKBURN IRIS. THIS LARGE 2,100-H.P. FLYING BOAT WAS A MODIFICATION OF ANOTHER BIG BLACKBURN DESIGN PRODUCED IN 1926. ORIGINALLY INTENDED AS A LONG RANGE NAVY BOMBER IT WAS ALSO USED COMMERCIALY.

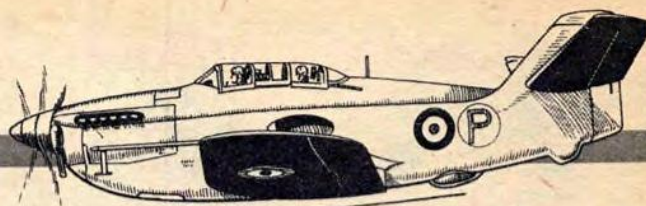
Robert Blackburn, founder of the British Blackburn Aeroplane and Motor Company, designed and built his first flying craft in 1909. It was not a great success but his second effort resulted in one of the best airplanes of the period. From then on the entire Blackburn story has been one of phenomenal progress. Curiously enough this firm has not made any particular effort in the jet-power field or, if so, such activity has not been publicized.

In World War I Blackburn aircraft distinguished themselves most in Naval aviation, a field in which they pioneered and are still quite important. They did, however, build some notable landplanes such as the Blackburn

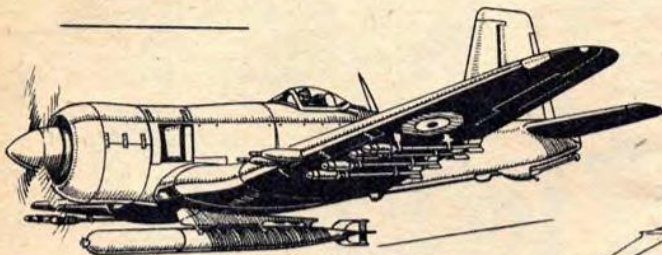


# The Blackburn Story

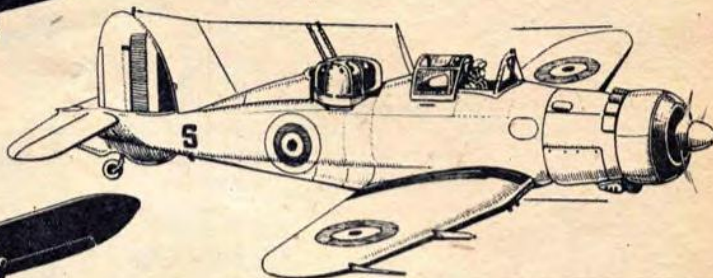
By DOUGLAS ROLFE



BLACKBURN Y.A.5 PROTOTYPE MODEL OF ▲ LATEST BRITISH LONG RANGE ANTI-SUBMARINE AIRCRAFT. IT FEATURES CONTRA-ROTATING PROPELLERS AND TRICYCLE LANDING GEAR AND IS IN STRIKING CONTRAST WITH THE FIRST DESIGNS



▲ BLACKBURN FIREBRAND V. STANDARD BRITISH NAVY STRIKE FIGHTER TODAY. THIS 2,500-H.P. HEAVILY ARMED PLANE IS ONE OF WORLD'S TOP PISTON-ENGINE DESIGNS BUT IS ALREADY DATED BY THE FASTER JETS



BLACKBURN ROC 905-H.P. RADIAL ENGINE ▲ A BRITISH NAVY ATTACK-BOMBER WHICH SERVED WITH DISTINCTION IN WORLD WAR II. IT'S COUSIN THE SKUA WAS SIMILAR EXCEPT FOR THE TURRET



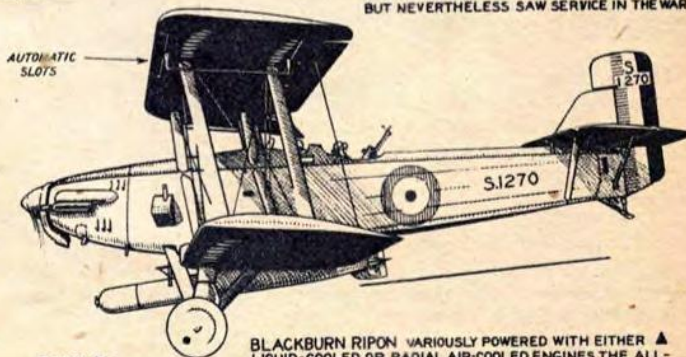
▲ DAY & NIGHT FIGHTER 600-H.P. ENGINE. A COMPARATIVELY UNKNOWN BLACKBURN DESIGN PRODUCED IN SMALL NUMBERS IN 1935.



BLACKBURN SHARK 700-H.P. RADIAL ▲ ENGINE. LAST BLACKBURN BIPLANE TORPEDO BOMBER, IT WAS OBSOLETE IN 1939 BUT NEVERTHELESS SAW SERVICE IN THE WAR



▲ BLACKBURN SEGRAVE TWO 120-H.P. DE HAVILLAND AIR-COOLED ENGINES. AN INTERESTING 1933 FOUR PASSENGER SHIP WITH A MAXIMUM SPEED OF ABOUT 138 M.P.H.



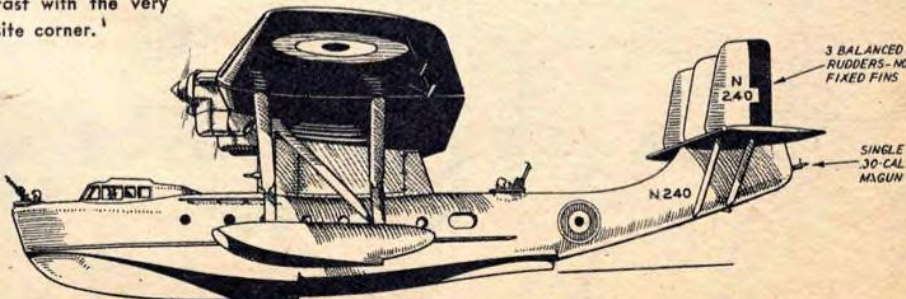
BLACKBURN RIPON VARIOUSLY POWERED WITH EITHER ▲ LIQUID-COOLED OR RADIAL AIR-COOLED ENGINES THE ALL-METAL RIPON WAS STANDARD BRITISH TORPEDO-BOMBER FOR SEVERAL YEARS DURING THE EARLY NINETEENTHIRTIES

Kangaroo—an oversize bomber that resembled the old Handley Page Type 400 and was the first airplane to fly from England to Australia (Capt. Keith Smith, late 1919).

The illustrations indicate the Blackburn preoccupation with naval aircraft of all types, but today they also put out one of the best 15-ton airfreighters on the market. In the past they have also manufactured lightplanes and civil aircraft of every description.

Their latest product, the prototype anti-submarine attack plane, shows the typical Blackburn fondness for naval types and incidentally affords a striking contrast with the very first Blackburn design shown in the opposite corner.

BLACKBURN SYDNEY THREE 525-H.P. ▲ ROLLS-ROYCE ENGINES THIS LARGE NAVY PATROL BOAT REPLACED THE IRIS CLASS BOATS. ITS GENERAL DESIGN IS SUGGESTIVE OF THE MUCH LATER CONSOLIDATED PBY BOATS USED BY THE U.S. NAVY IN LAST WAR

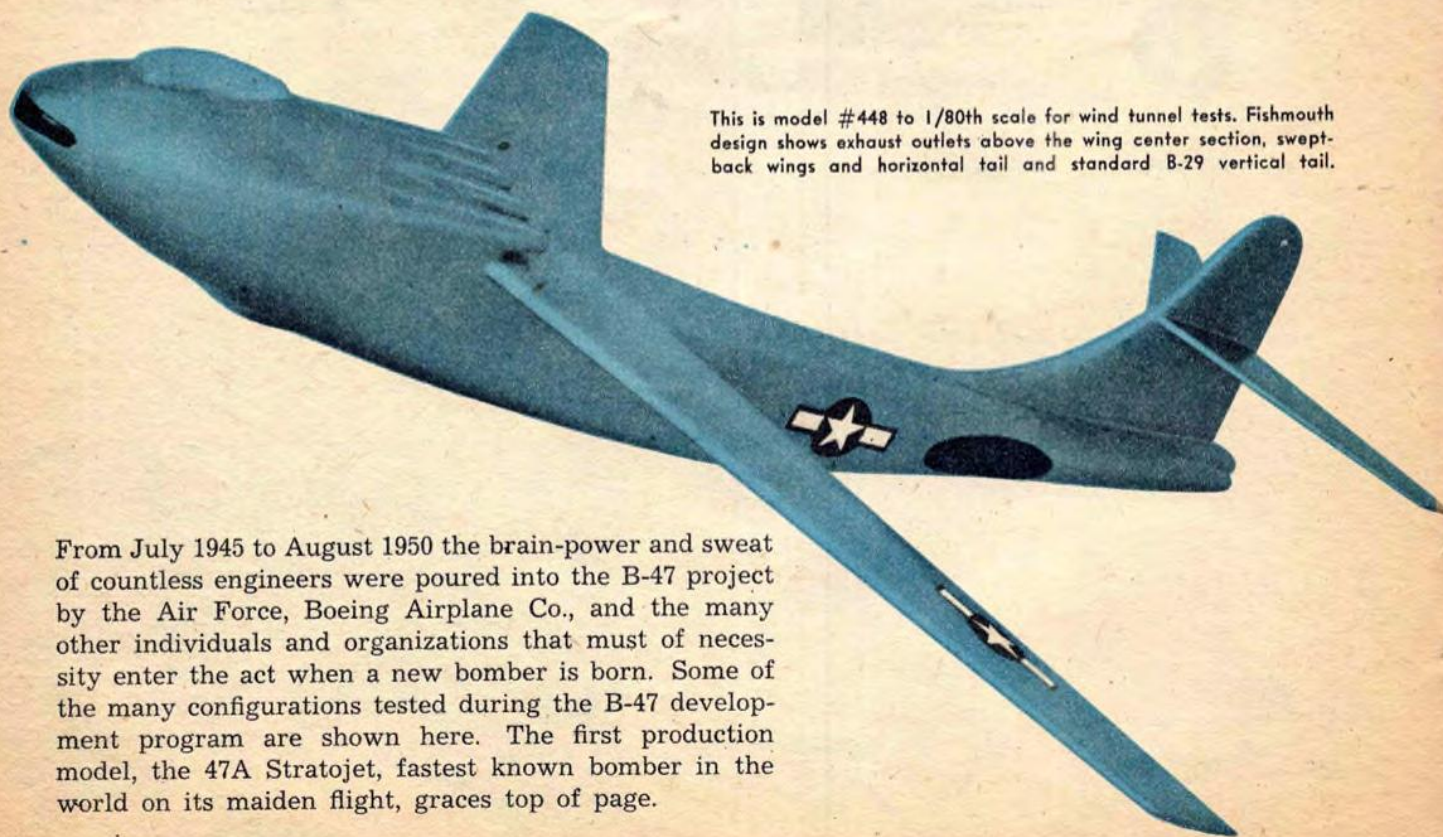




# B-47 { FROM BIRTH TO BATTLE



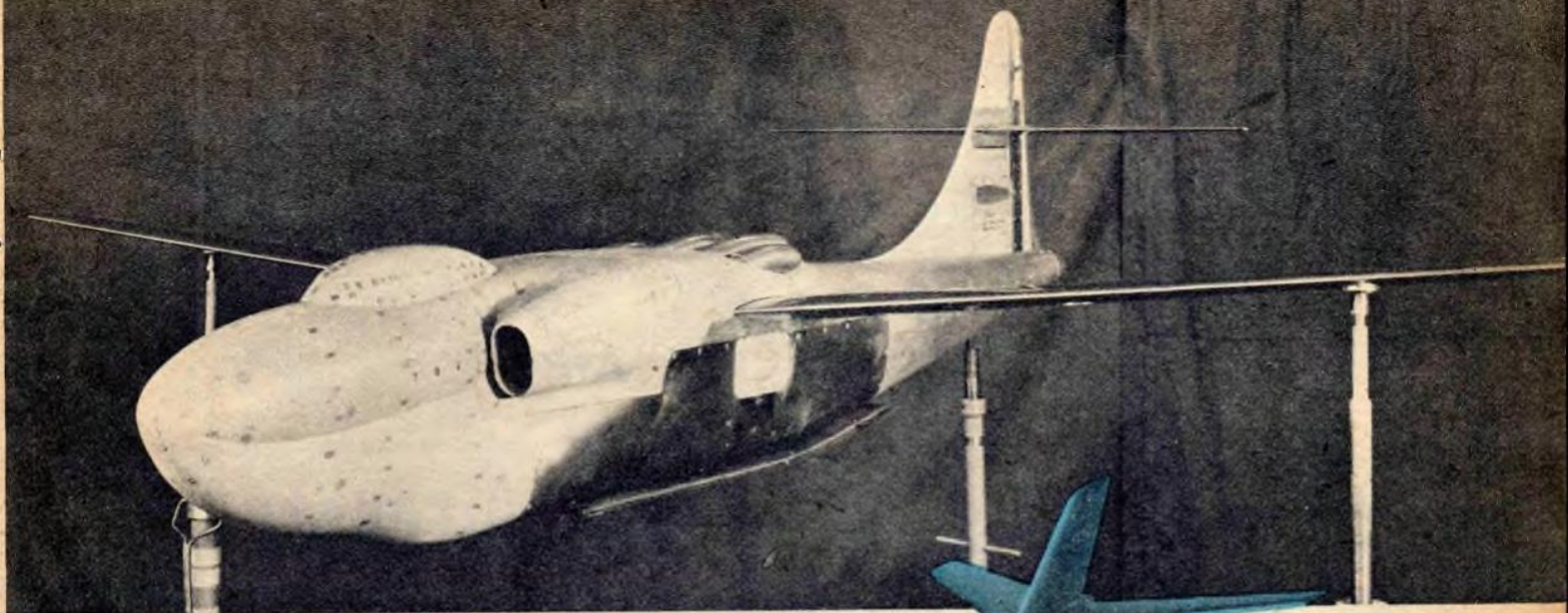
It's a long jump to the finished production bomber (above) from the early design stages—ask Boeing



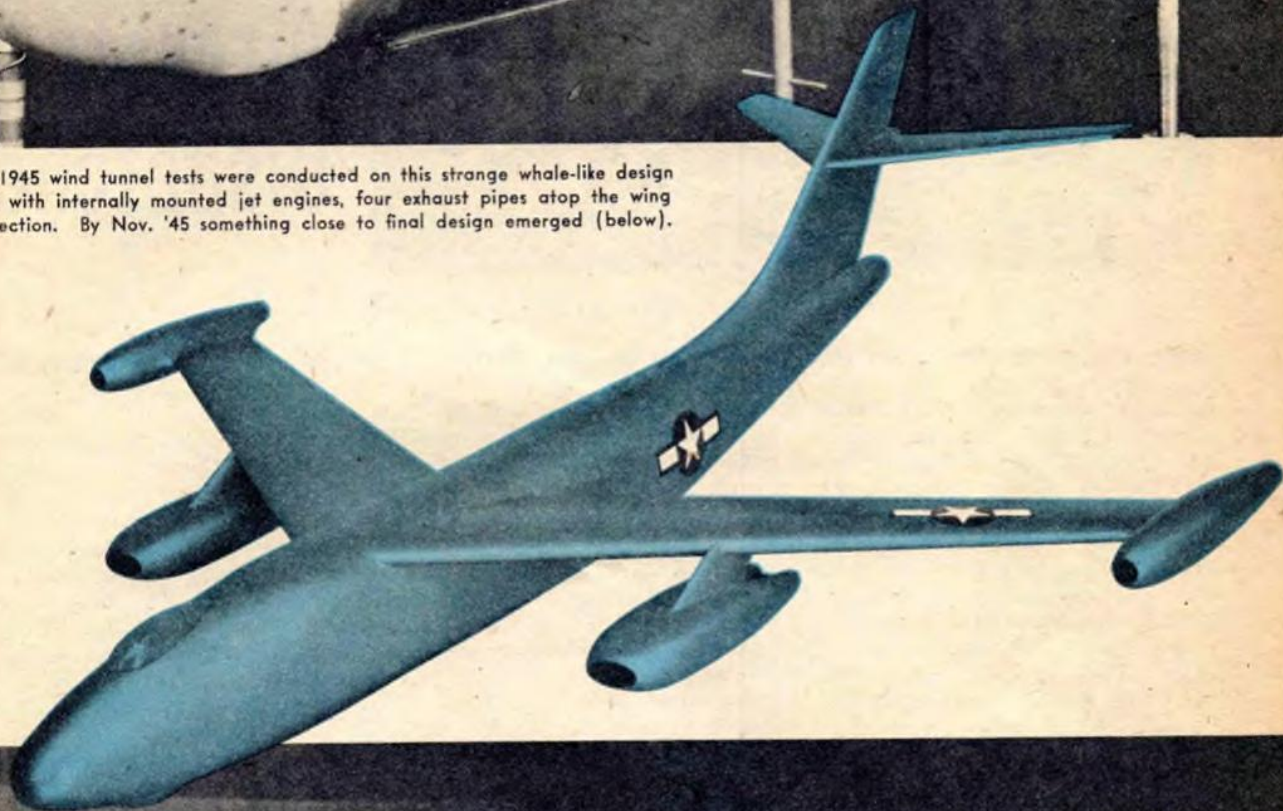
This is model #448 to 1/80th scale for wind tunnel tests. Fishmouth design shows exhaust outlets above the wing center section, swept-back wings and horizontal tail and standard B-29 vertical tail.

From July 1945 to August 1950 the brain-power and sweat of countless engineers were poured into the B-47 project by the Air Force, Boeing Airplane Co., and the many other individuals and organizations that must of necessity enter the act when a new bomber is born. Some of the many configurations tested during the B-47 development program are shown here. The first production model, the 47A Stratojet, fastest known bomber in the world on its maiden flight, graces top of page.

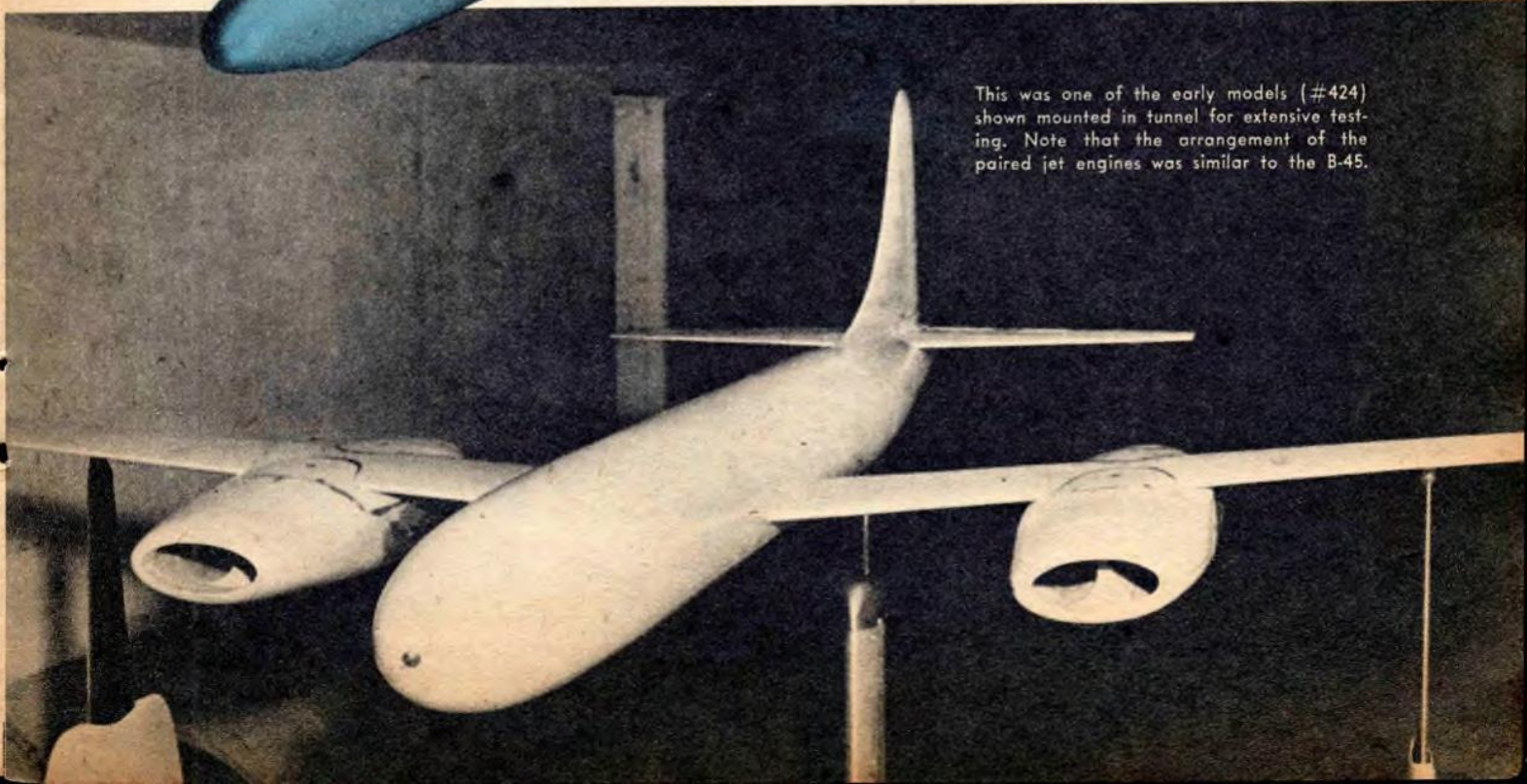




In July 1945 wind tunnel tests were conducted on this strange whale-like design (above) with internally mounted jet engines, four exhaust pipes atop the wing center section. By Nov. '45 something close to final design emerged (below).



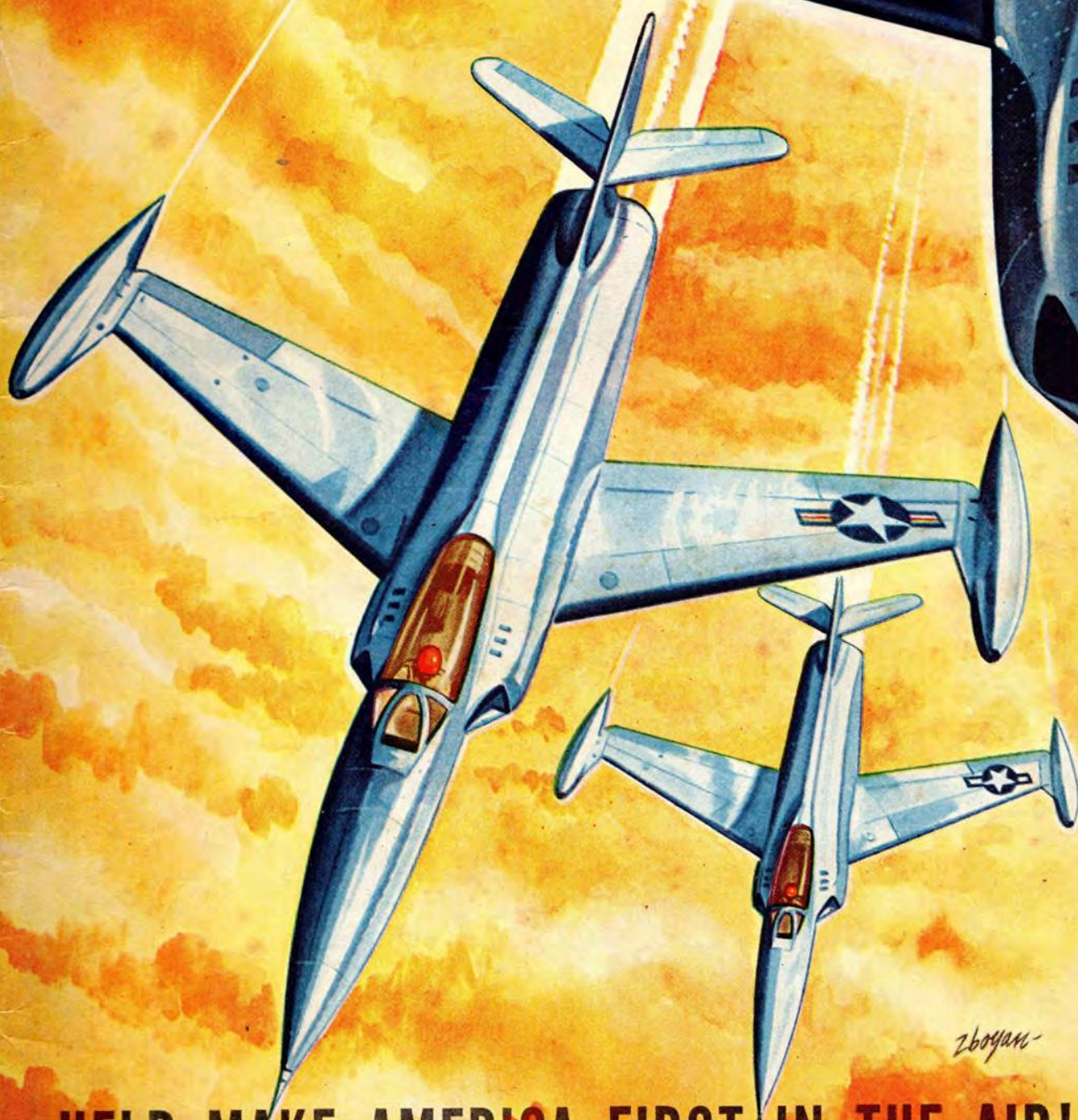
This was one of the early models (#424) shown mounted in tunnel for extensive testing. Note that the arrangement of the paired jet engines was similar to the B-45.





# AIR TRAILS

MARCH 1951  
25 CENTS



*zboyan*

**HELP MAKE AMERICA FIRST IN THE AIR!**

**Join The Air Adventurers Club — See Page 34**



# AIR TRAILS

MAR., 1951 • VOL. XXXV, No. 6

All communications to the Air Trails editorial offices should be addressed to Air Trails, 304 East 45th St., New York 17, N. Y.

## IN THIS ISSUE:

|                                                      |                 |    |
|------------------------------------------------------|-----------------|----|
| Cover.....                                           | Zboyan          | 1  |
| The Woman's Angle.....                               | Nonie Horton    | 10 |
| Light/Sail Plane Parade.....                         |                 | 12 |
| Airmen of Vision.....                                |                 | 14 |
| Air Notes.....                                       |                 | 16 |
| The Navy Fighter Is Best!                            | Robert McLaren  | 21 |
| Development Highlights.....                          |                 | 24 |
| Air Progress: Development of the Military Plane..... | Doug Rolfe      | 26 |
| Mr. Sikorsky and the Helicopter                      | Wm. S. Friedman | 28 |
| Job in Aviation: Flight Instructor..                 |                 | 29 |
| Helio Two.....                                       |                 | 30 |
| Ahead of His Time.....                               | Frank Tinsley   | 31 |
| Air Adventurers Club.....                            |                 | 34 |
| Nameless Passenger                                   | George Gardner  | 36 |
| Crowbar "56".....                                    | Ray Matthews    | 37 |
| Dope Can.....                                        | "Dopester"      | 41 |
| Petit Pete.....                                      | Bernard O. Beck | 42 |
| Hot off the Wire.....                                | S. C. Smith     | 44 |
| Bill Barnes' Amphib Fighter.....                     |                 | 45 |
| Vought F7U Cutlass.....                              |                 | 48 |
| Wakefield: Shape of Things to Come.....              |                 | 50 |
| MIG 15 Russian Jet Fighter.....                      |                 | 51 |
| Motor of Month: Spitzzy.....                         |                 | 52 |
| Model of Month: Lift Master.....                     |                 | 54 |
| Sketchbook.....                                      |                 | 56 |
| Western Round-up.....                                | Dick Everett    | 58 |
| Plan Form of Future Wakefield Model.....             | Frank Ehling    | 60 |
| Showcase.....                                        |                 | 84 |

Editor.....Albert L. Lewis  
Art Director.....W. F. Tyler  
Technical Editor.....Alexis Dawydoff  
Editorial Production.....Carl Happel  
Editorial Assistant.....Rose Borello  
Washington Correspondent: Kendall K. Hoyt

## STREET & SMITH PUBLICATIONS, Inc.

President.....Gerald H. Smith  
Vice President.....Henry W. Raiston  
Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser  
Walter J. McBride, Advertising Mgr., 122 E. 42nd St., New York 17; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Office, 903 Garfield Bldg., Los Angeles 14, California.

● AIR TRAILS published monthly by Street & Smith Publications, Inc., at 122 East 42nd St., New York 17, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail, Post Office Dept., Ottawa, Canada. Copyright, 1951, by Street & Smith Publications, Inc. 25¢ per copy—\$2.50 per year. \$7.50 per year in countries of the Pan-American Union; \$3.00 per year in Canada; \$10.00 per year elsewhere.

● Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us.

● Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y.

● All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage. Printed in the U. S. A.

## THE READERS WRITE:

**Popular in Japan** . . . You will be interested to know that I purchased my last copy of Air Trails in Hongkong. I have noticed Air Trails at many places during my Oriental tours and can assure you personally that it is enjoying great and growing popularity in Japan.

Dallas B. Sherman, Regional Director—Orient, Pan American World Airways System

**Hey, Betty!** . . . My very first impression upon reading the article by Betty Skelton, "Girl vs. Airplane," was to tell Miss Skelton that she need not play second fiddle to anyone, much less to an airplane.

If Miss Skelton will pardon my getting personal, I think she is the nicest thing that has happened to aviation for a long time. She is very cute, just the way I like my women and I'm sure I'm not the only male to think so. Her proportions would certainly interest me more than those of the airplane.

I follow aviation, have been building model airplanes for some years, and yet I still have the normal male appreciation of things. According to Miss Skelton I am in the possible minority. I hope not.

If she will be so good as to fly to Baltimore, my home town, I will be more than happy to buy her a hamburger, to say the least. I realize the article was written as a satire (I hope) but then, a little reassurance never hurt any woman's ego.

I'm for you one hundred percent, Miss Skelton!

Bruce Packham, Univ. of Md., College Park, Md.

**Draftings of Thompson Trophy Winners** . . . I am very interested in obtaining exact three-view drawings and photographs of all the Thompson Trophy Race winners. At present I have several sets of plans for some of the planes but they differ so widely in configuration that I don't know which ones to use. I would sincerely appreciate your help in putting me on the track of some accurate drawings containing three-views, cross-sections and airfoils of all the winners suitable for producing exact detailed models of these planes.

Roger A. McIntyre, Columbus, Ohio

● We believe you will find what you want in "National Air Race Sketchbook," by Buehl and Gann, published by Floyd Clymer, 1268 South Alvarado St., Los Angeles 6, Calif. The price is \$2.

**Anybody Seen a Midget?** . . . In reading over the Dope Can I noticed Mr. Davis' letter about the AT Cruiser. I built one and installed an OK .049, then second flight—O.O.S. That was over a month ago and it hasn't been found yet.

I also have a beef about AT, otherwise a darn good mag, but the midgets are cluttering up the joint. It has been many an issue since I've seen a model for the so-called popular B engines, scale or semi-scale preferred.

Jim Moses, Elmore, Minn.

**Flying Wing Kits?** . . . I would like to know where I could obtain a kit for a flying wing using a Class A engine (with a pusher propeller).

I like Air Trails very much because it started me on my model airplane building hobby.

Michael Volow, Kings Park, N. Y.

● Sorry, we know of no flying wing kits.

**Pleasant Idea** . . . For years the people who build model airplane engines such as Ohlson & Rice, McCoy and many others have built only two-cycle engines which use expensive fuels. What I want to know is why somebody doesn't make a four-cycle engine than can run on car gasoline.

John Stankovich, Renton, Pa.

● Far too expensive.

**A Stamp Pal** . . . I read the letter in "The Readers Write" saying you give the stamps on mail from overseas to service men in a VA hospital near New York. I used to collect foreign stamps myself but gave it up after a while. So enclosed are some foreign and U. S. stamps to be sent to service men in the hospitals and would you let me have some of their names and addresses so I could get a few pen pals to write to.

Wayne Janicki, Sharon Springs, N. Y.

● Anybody on this roster anywhere is invited to answer the request.

**Approved by Headquarters** . . . The "Link Instructor" story . . . in your magazine is a good one . . . Your series about jobs in aviation is one that will be of value to both teachers and the youth of our country. Guidance in the field of aviation can stand shots in the arm like this. Keep it up.

Philip S. Hopkins, Vice President, Link Aviation, Incorporated, Hillcrest, Binghamton, N. Y.

**Cadet Fever** . . . I am fifteen years old and an enthusiastic model builder. As I am a freshman in this hobby, I would appreciate any suggestions you can pass along to me on the following topic.

For about a year I have had in my possession two miniature gasoline engines, a McCoy 29 and a Cub 74, with airplanes to suit, the Key for the 29 and the Key-det for the 74. This is my problem. Having invested a considerable amount of money in these projects, I find myself afraid to try to fly these airplanes. What should I do?

Bob Leahy, 122-24 Lucas St., St. Albans, N. Y.

● Model builders aren't afraid of anything! On the constructive side, will some more experienced members of model clubs in Bob's vicinity contact him and help check him out on that solo?

**Different Kind of Drawing** . . . I'm afraid this is the last drawing I'll be able to do for AT for a long, long time.

Al Johns, Los Angeles, Calif.



● We salute you, Cartoonist First Class Johns!

**To Enter the Nats** . . . I think your mag is by far the best in planes, also it is a help to us youngsters. But there are a couple of things I would like to know. What does "jettisonable" mean? And a friend told me you have to fly and win in another contest to enter the "Nats," but I disagree. Can you set us right?

Pat Keating, Yankton, So. Dak.

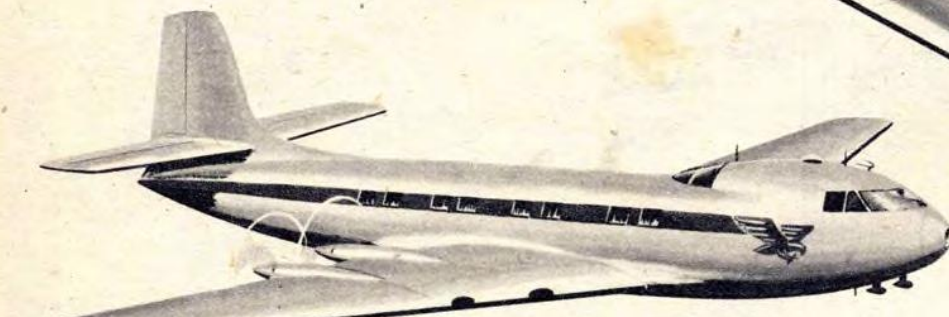
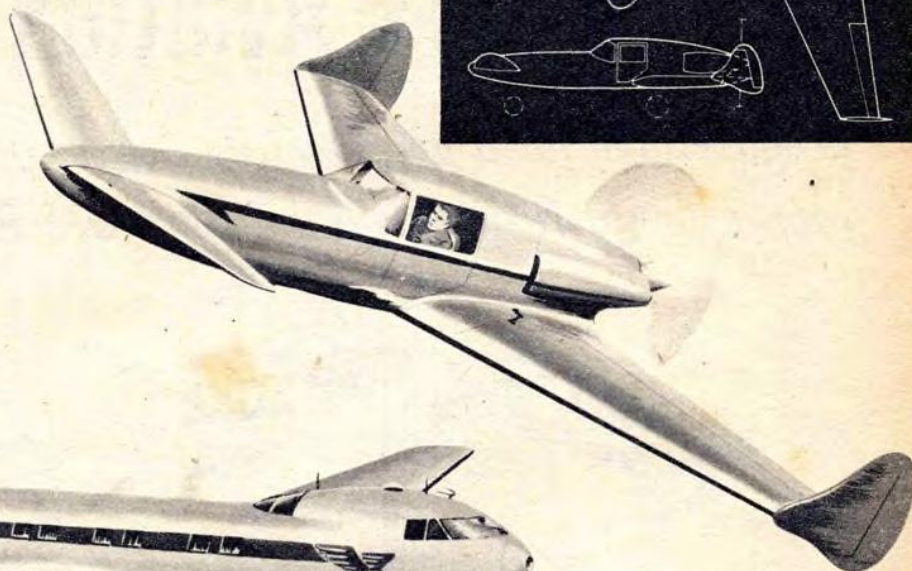
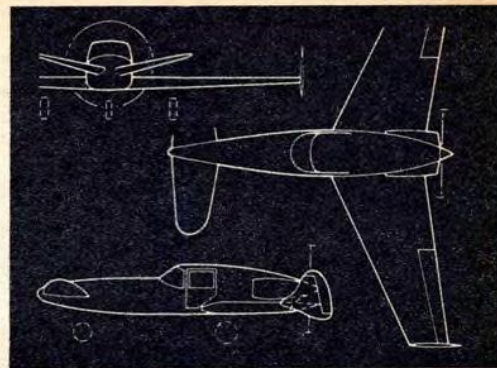
● The National meet is open to anyone with an A.M.A. license who can pay the nominal entry fee. "Jettisonable" as applied to aircraft means that a part, usually an external wing tank, can be dropped in flight. (Continued on page 9)



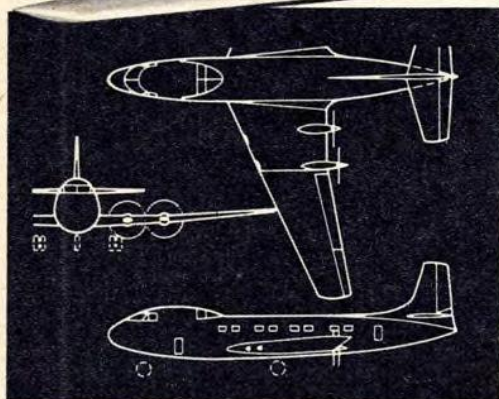
# Airmen of Vision

## DESIGN COMPETITION

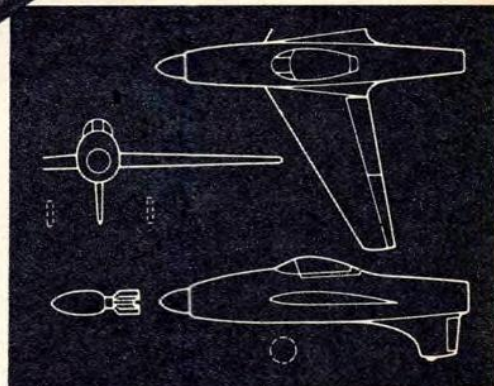
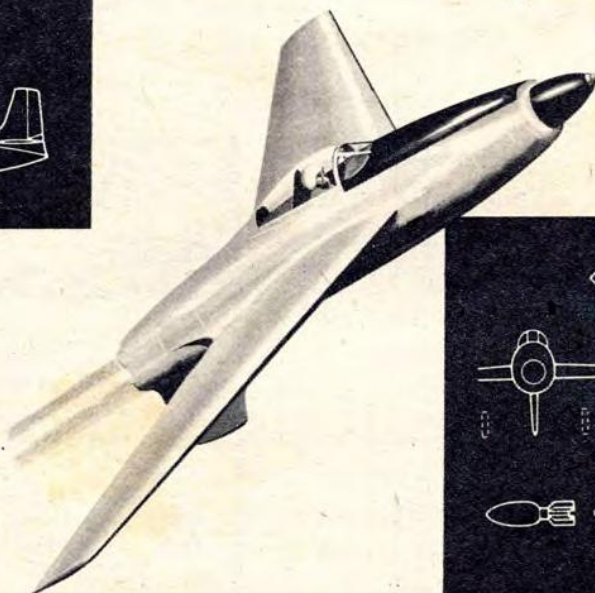
George W. Dunbar of Nashville, Tenn., is in front this month with original canard personal plane design. It is spin and stall resistant as the forward surfaces will stall ahead of wing. Lateral and yaw control are by means of ailerons and rudders at wingtips. Entire forward surfaces are movable, serving as elevators. Plane is all metal, carries two, has large baggage allowance. Span 30 ft., top speed 190 mph.



Second honors go to Philip de Carolis of Astoria, N. Y., for his design of interesting turbo-prop transport. Built-in, hydraulically operated steps. Crew compartment raised for better visibility and comfort. Span 112 ft. Cruising speed 405 mph.



The Jolly Roger, a very intriguing interceptor by Walt Holmes of Dubuque, Iowa. Carries a rocket shell in opening of the nose which also serves as air intake for jet engine after the rocket is fired. Prior to that, propulsion is furnished by a rocket engine. Inboard control surfaces on trailing edge of wing are elevators; outboard, ailerons. Span 24' 7 1/2", top speed 850 mph.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



# The Navy Fighter is Best!



F7-U (CUTLASS)

■ The Navy carrier-based jet fighter is the most potent defensive weapon in this nation's aerial arsenal. A sweeping statement? Sure it is—but here are the facts and figures to prove it. These data were compiled on the basis of officially released information; there are no military secrets here, believe it or not!

The chart on page 23 is a complicated maze of curves and intersections that looks like a crazy patchwork quilt, but if you'll come along this jigsaw puzzle while we thread our way slowly and carefully through it, you'll see why the Navy fighter is the best defense we've got against atom-laden Russian bombers.

Aircraft performance estimation is a complicated business, and if you think the chart is involved you should have seen the sheaves of papers used in its preparation. Into such calculations must go lift and drag coefficients, equivalent parasite areas, L/D ratios, span loadings, parasite loadings, span efficiency factors (both straight and swept wings), velocity and thrust ratios, *et cetera*. But all these complex formulas and ratios can be reduced down to two simple parameters that permit all aircraft to be compared qualitatively at least, and that's all we're interested in here.

The first of these is wing loading, which is simply the gross weight of the airplane divided by its wing area, giving



14,000

13,000

12,000

11,000

10,000

9,000

8,000

7,000

6,000

5,000

4,000

3,000

2,000

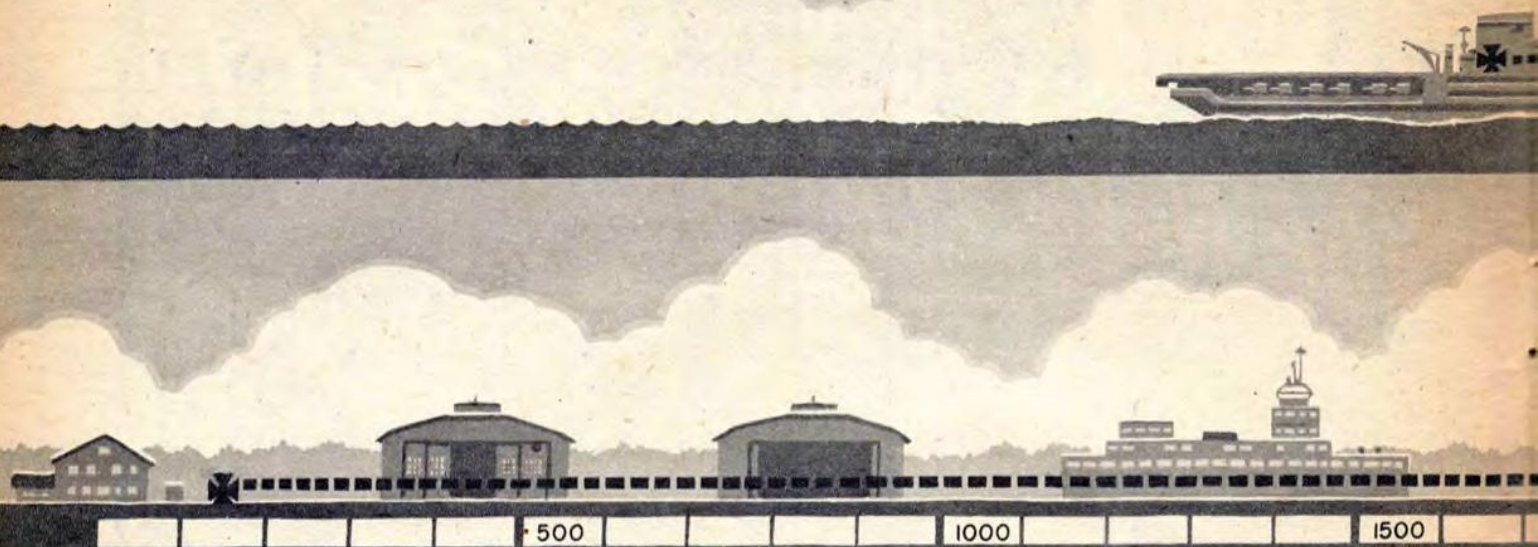
1,000

By **ROBERT McLARREN**





## NORMAL CARRIER FIGHTER TAKE-OFF: 600 FEET



the number of pounds each square foot of wing must lift. Obviously, the more weight each unit of wing area must lift, the more power that is required to move it through the air. Just to give you a familiar framework of reference it might be pointed out here that the wing loading of the Piper Cub is about 7 lb./sq. ft., that of the Bell X-1 supersonic research plane is 100 lb./sq. ft. All the airplanes we're going to discuss lie somewhere in between!

The second of these parameters is power loading, the gross weight of the airplane divided by the available thrust of the turbo-jet engine, giving the number of pounds of airplane that each pound of thrust of the engine must propel. The less this ratio, the faster and better-performing is the airplane.

Let's take our first look at the chart now and see how Navy and Air Force jet fighters compare on the basis of these two ratios. The abscissa (horizontal line) of the chart is the wing loading of the various fighters shown, and these increase toward the right. The further to the right your airplane is located, the higher is its wing loading. You'll note that there is a sharp dividing line between the Navy fighters (indicated by the squares) and the Air Force fighters (indicated by the circles) at about 55 lb./sq. ft. The Navy fighters

generally lie to the left of this loading, indicating that they have lower wing loadings than the Air Force fighters, which generally lie well to the right of this dividing line.

It is easy to see why this is so. The Navy plane must operate from the restricted deck of the aircraft carrier; the latter's runway is 500-900 ft. long, while the Air Force runway is 5,000-10,000 ft. long. The first argument advanced by the anti-carrier man is that this limited deck length puts a crimp in the Navy airplane which forever prohibits it from matching the Air Force fighter as a weapon. BuAer (Bureau of Aeronautics) engineers like this one, because it's so easy! Their answer: the things that must be done in the design of an airplane to make it a successful carrier plane are the very things that make it a superior all-round fighting machine!

The usual criticism is leveled at the short take-off distance available to the Navy plane. What these critics don't know is that since late in World War II take-off has been absolutely no problem to the Navy pilot. All Navy jet fighters are now catapulted off the carrier deck, attaining a speed of 150 ft./sec. in just over two seconds along a distance of only 150 ft., which requires an acceleration of only about  $2\frac{1}{2}G$ , and not the

10-12G often claimed necessary. With two deck catapults in operation, which is usually the case (the U.S.S. *United States* super-carrier was to have four deck catapults), a complete jet fighter squadron of 18 aircraft can be launched in  $4\frac{1}{2}$  minutes.

This is to be compared with the 12 minutes required for a land-based jet fighter squadron to get airborne—and minutes are precious things in interception work. That  $7\frac{1}{2}$  minutes saved by the carrier launching means 75 miles in distance in the air, which is about radar detection range for standard service units!

The carrier jet fighter design problem is not take-off, it is landing aboard the carrier. This isn't nearly so tough as you might think. First of all, the carrier steams into the wind which gives the jet fighter a 30-40 knot headwind to start with. He can make his approach at the usual 100 mph and still touch down at only 60-70 mph relative to the deck. If there's a wind at sea of say 10-20 mph, then his actual landing speed is further reduced to only 40-60 mph, and that's getting down to Cub figures.

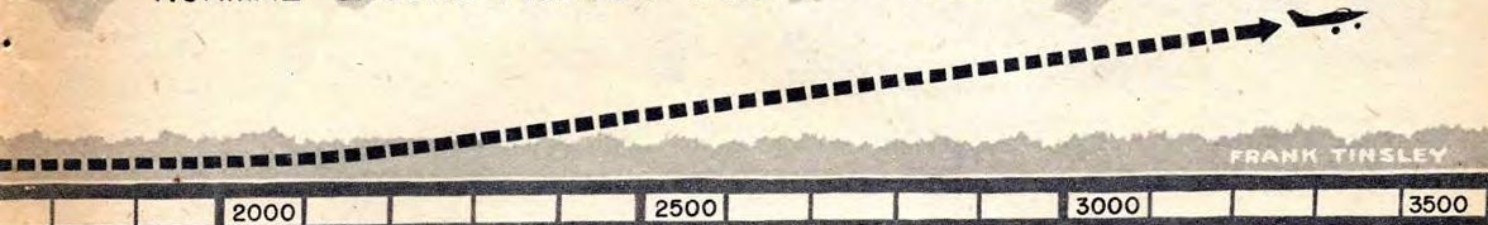
However, the designer has got to assume there is no wind and that his airplane is going to hit the deck at a full 100 mph or less. Landing speed is reduced by high-



## CATAPULT TAKE-OFF: 120 FEET



## NORMAL GROUND FIGHTER TAKE-OFF: 3200 FEET



lift devices (such as the nose flaps on the Grumman F9F Panther, the landing flaps on all modern fighters), by high-lift wings themselves and by low wing loadings. All of these things also shorten take-off and improve lateral control. It is for these reasons that the Navy carrier jet fighter has its low wing loading as compared to its land-based counterpart.

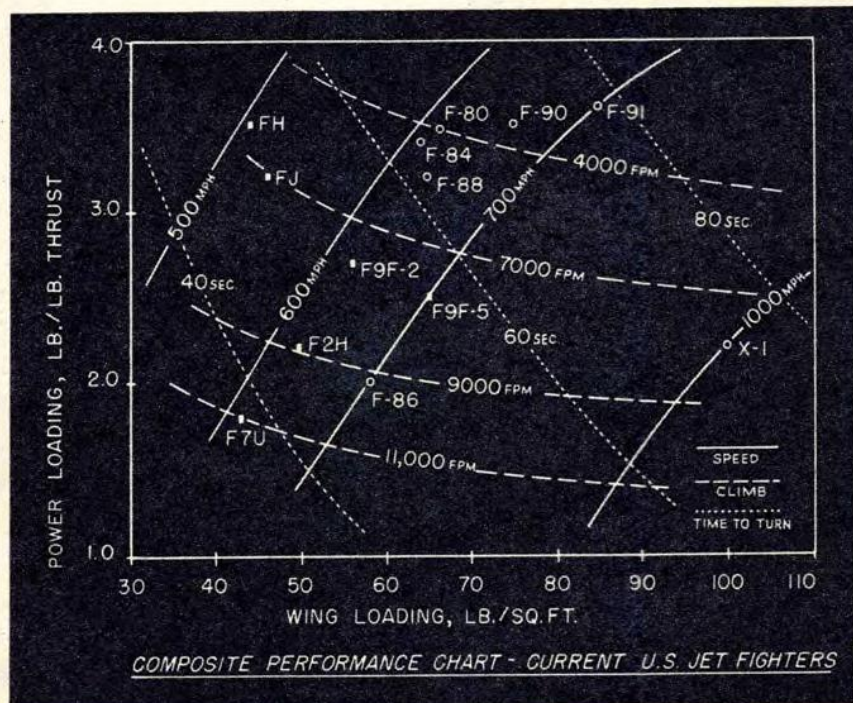
If we now look at the ordinate (vertical line) of the chart, we'll see that both Air Force and Navy fighters are pretty well scattered up and down the figure on the basis of power loading. The important point here, however, is not where the airplane falls on the power loading scale as such. The vital consideration is the combination of low wing loading with low power loading. This is a difficult design problem. Low power loading can be obtained by simply cramming bigger and bigger engines into an airplane, but this makes the weight go up and, therefore, the wing loading. The thing to look for here is how close the airplane comes to the lower left side of the chart—and notice how the Navy airplanes are generally located down in this region, with the Air Force fighters drifting way upward toward the right!

The first thing we'll dispense with is speed. The layman's assessment of a fighter is always con-

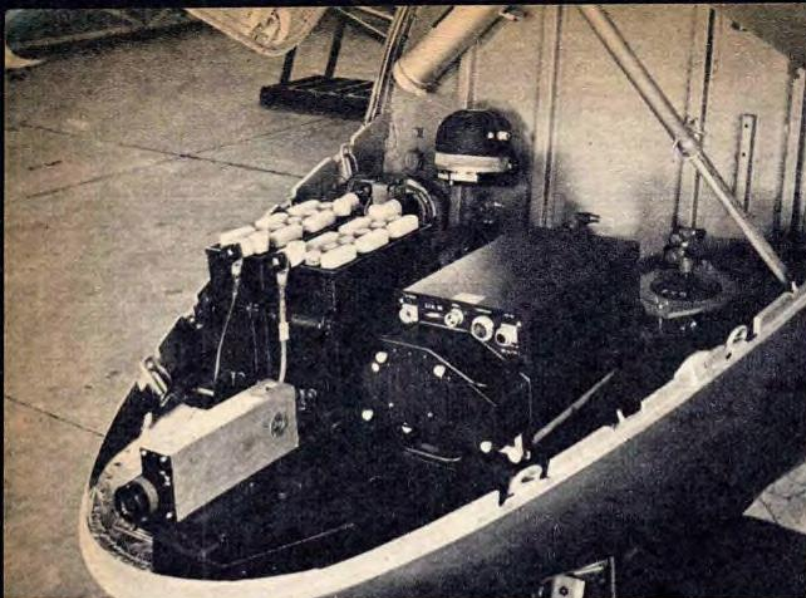
centrated in one brutally simple question: "How fast will it go?" If that was the pertinent question, the answer would be so easy: the Bell X-1 is the world's fastest airplane and, with guns, would be the hottest fighter in the world. But did you know that at its maximum speed of just under 1,000 mph it would take the X-1 a distance of eight miles to simply reverse its direction, during which time it would travel 25 miles through the

air? That's hardly the kind of maneuverability that wins sky battles, and this explains why the X-1 is now in the Smithsonian Institution and not in vast squadron service ready for action.

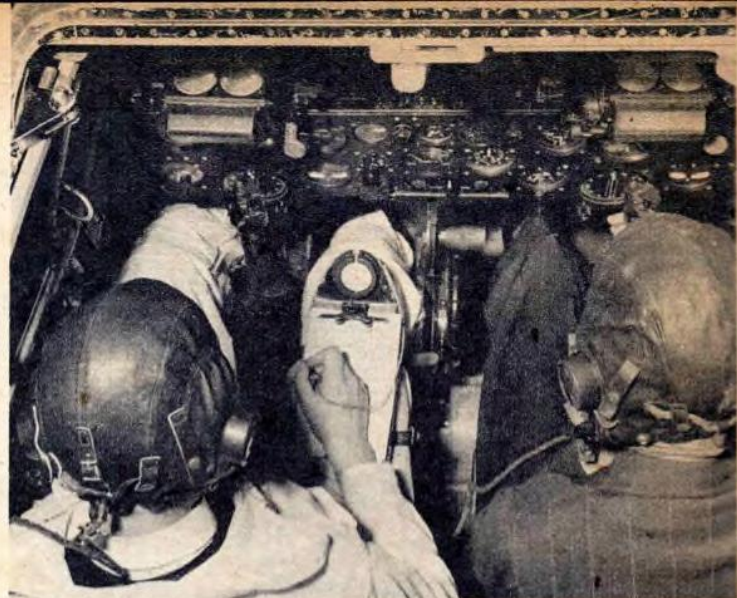
Yes, the Air Force fighter has it in speed. If you'll look at the gently sloping curves going upward and to the right, you'll notice that they are lines of equal speed; that is, all aircraft lying along one of these (Continued on page 72)



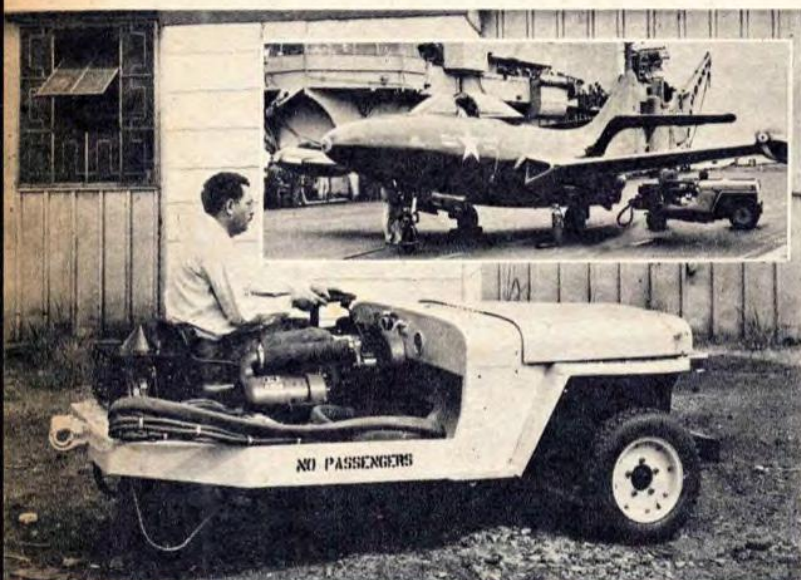




**Camera gun, battery, radio and oxygen equipment installed in the nose of the British Vampire jet trainer shown at right center. Excellent accessibility is attained by hinged nose cap.**



**Cockpit of Vampire trainer seats two side by side. Has duplicate set of instruments and two gun sights, jettisonable hatch, and is pressurized. Maximum speed is 530 mph at 40,000 feet altitude.**



**Starting jeep.** This three-wheeler converted from a standard jeep by O. A. Szekely & Associates, carries starting equipment for jet engines. Very maneuverable and suitable for use on carriers.



## Development Highlights

**Airlift 404** military cargo transport design one of which was recently turned over to the AF by Glenn L. Martin Co. Note large clamshell doors and ramp for loading of motor vehicles.

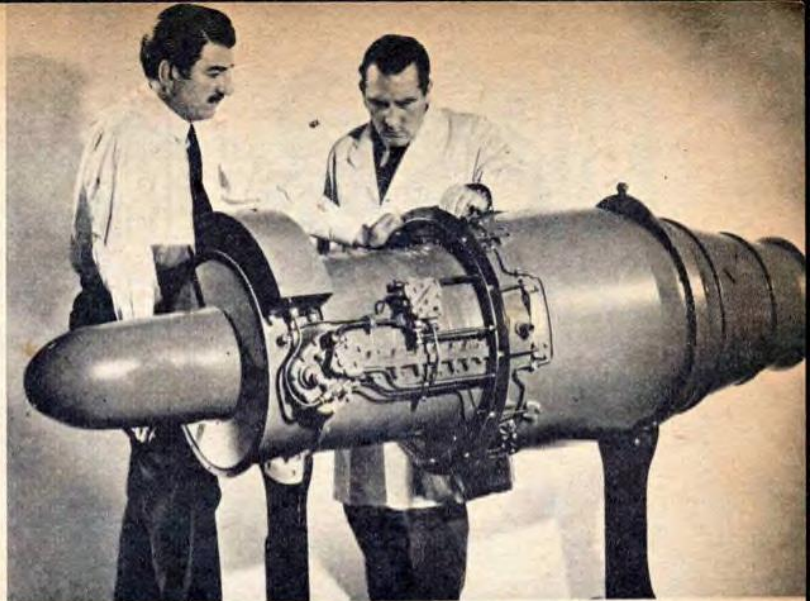
**Wing tip tanks** on the Airlift 400 will considerably extend its range. Preliminary specifications call for 15,000 lb. payload over combat range of 1,500 miles at 270 mph. Engines: 2500 hp P&Ws.







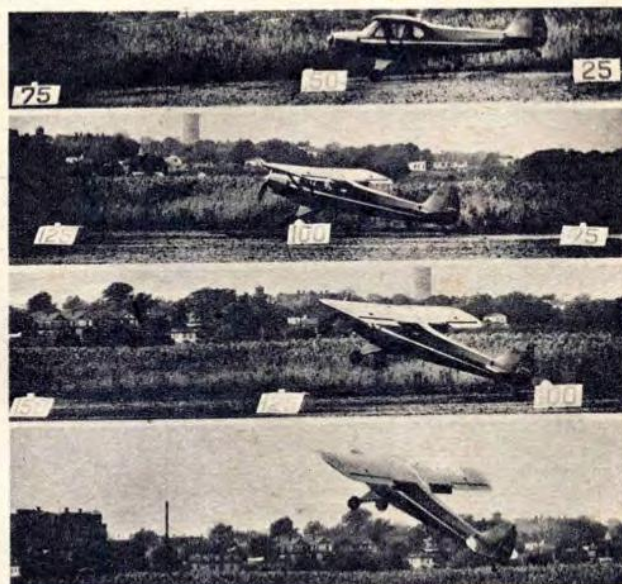
**Convair Turboliner** readied for test flight. Plane belongs to the Allison Co. and will be employed to test the 2,750 hp Allison 501 turbo-prop engines for use in the passenger air transport field.



**Armstrong Siddeley Viper**, small British turbo-jet engine specially designed for pilotless radio-controlled aircraft. Measuring only 20 in. in diam. and weighing 400 lbs., it develops 1,500 lbs. thrust.



**Fouga Cyclope**. Acrobatic and training sailplane powered by a Turbomeca Pimene jet engine. Plane is smaller than the model which flew in Miami last year. Span is 28.7 ft. Top speed 280 mph.



**Quick take-off** characteristics of the new Super Cub are demonstrated here. Plane climbs steeply after a 100 ft. run. Performance obtained by starting with flaps up, lowering them after 50-ft. run.

**Spherical visor** of green transparent plastic gives jet pilot good vision and prevents crash helmet from flying off in the event of high-speed bail-out. Was developed by the Air Materiel Command.



**Tri-Pacer**. Companion to the 1951 Piper Pacer is this tricycle gear airplane, which goes into production in March. Nose wheel is steerable through rudder pedals. Rudder and aileron are interconnected.

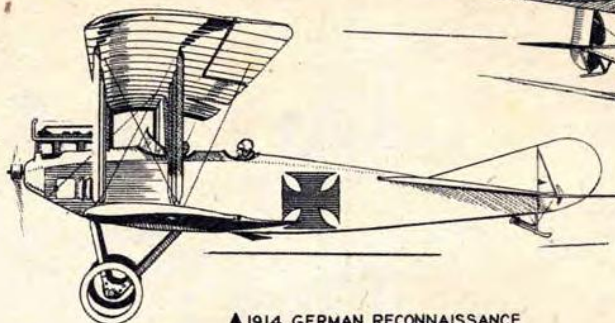




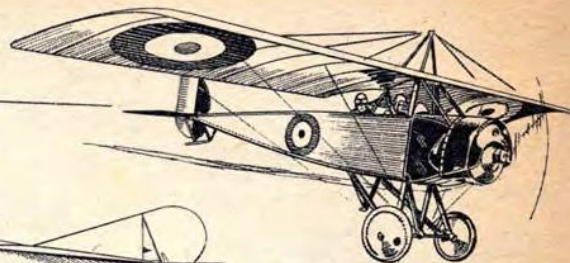
# AIR PROGRESS

By DOUGLAS ROLFE

A MACHINE OF THIS SAME TYPE WAS FIRST AIRPLANE IN THE WORLD TO REMAIN IN THE AIR FOR OVER 24 HOURS, NON-STOP. (JULY 1914). ▼



▲ 1914 GERMAN RECONNAISSANCE  
ALBATROS BIPLANE.—100 H.P. 6-IN-LINE  
LIQUID-COOLED BENZ ENGINE.—UNARMED

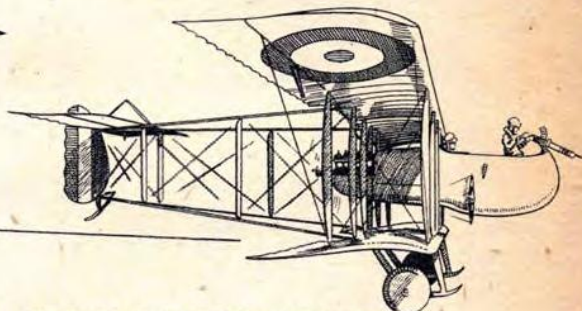


▲ 1914-15 FRENCH RECONNAISSANCE  
MORANE-SAULNIER PARASOL. 80 H.P. LE  
RHONE ROTARY ENGINE.—AT FIRST UN-  
ARMED BUT LATER PROVIDED WITH A DE-  
FENSIVE GUN AND A MAKESHIFT MOUNTING  
(DISMANTLED GUN WAS STOWED IN REAR COCKPIT,  
ASSEMBLED AND MOUNTED ONLY WHEN NEEDED.)

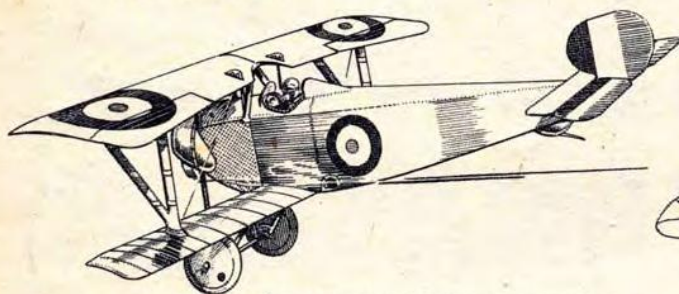


▲ 1914 BRITISH GENERAL PURPOSE  
AVRO 504K.—50-80 H.P. GNOME ROTARY  
ENGINE.—BRIEFLY EMPLOYED AS AN UN-  
ARMED OBSERVATION PLANE AND MAKE-  
SHIFT BOMBER IT BECAME, WITH 100 H.P.  
MONO-GNOME, STANDARD BRITISH BASIC  
TRAINER FOR REMAINDER OF 1914-18 WAR

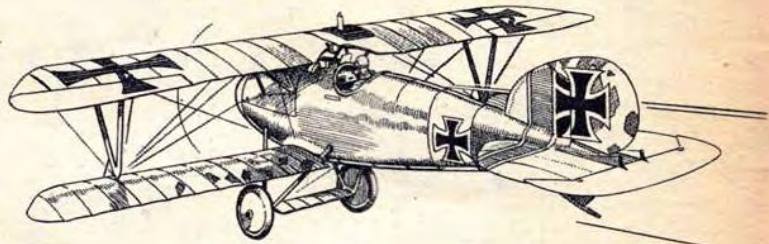
DOUGHNUT TIRES WERE FOUND IMPRACTICAL  
FOR THE PREVAILING SOFT RUNWAYS OF THIS  
PERIOD AND SOON REPLACED WITH LARGER WHEELS



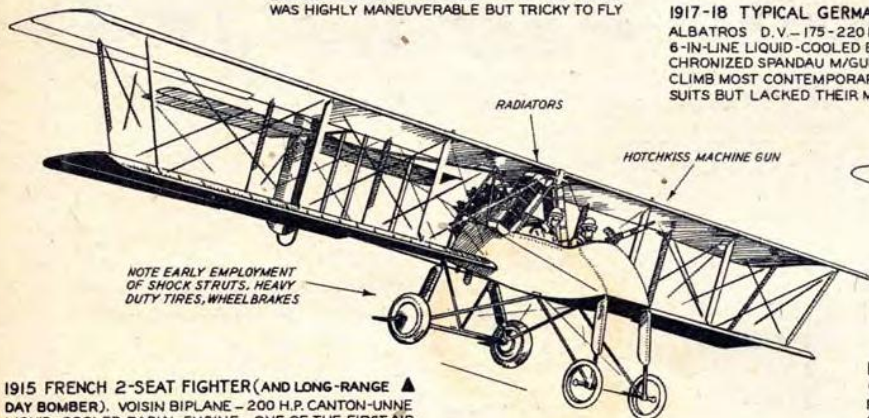
▲ 1915 FRENCH ARMED RECONNAISSANCE  
FARMAN F-40.—130 H.P. RENAULT AIR-COOLED  
V-8 ENGINE.—KNOWN AS THE HORACE FARMAN  
SINCE IT WAS A COMBINATION OF THE EARLIER  
HENRI AND MAURICE FARMAN DESIGNS WHICH  
HAD PROVED OF LITTLE REAL MILITARY VALUE.



▲ 1914 FRENCH "SCOUT" NIEUPORT SESQUI-  
PLANE. 80 H.P. GNOME OR LE RHONE ROTARY EN-  
GINE.—PLANES OF THIS TYPE THOUGH AS YET  
COMPLETELY UNARMED MAY BE REGARDED AS  
THE TRUE ANCESTORS OF THE MODERN PISTON-  
ENGINE FIGHTER.—THE NIEUPORT OF THIS DATE  
WAS HIGHLY MANEUVERABLE BUT TRICKY TO FLY

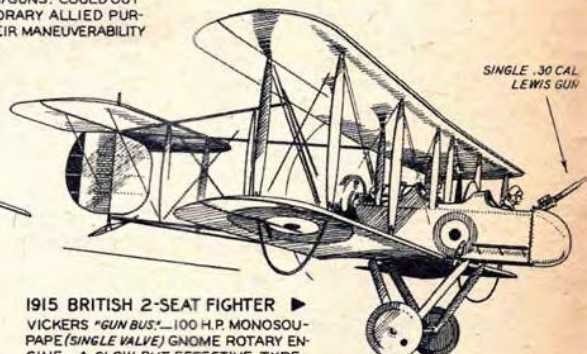


▲ 1917-18 TYPICAL GERMAN PURSUIT  
ALBATROS D.V.—175-220 H.P. MERCEDES  
6-IN-LINE LIQUID-COOLED ENGINE. 2 SYN-  
CHRONIZED SPANDAU M/GUNS. COULD OUT-  
CLIMB MOST CONTEMPORARY ALLIED PUR-  
SUITS BUT LACKED THEIR MANEUVERABILITY



NOTE EARLY EMPLOYMENT  
OF SHOCK STRUTS, HEAVY  
DUTY TIRES, WHEEL BRAKES

▲ 1915 FRENCH 2-SEAT FIGHTER (AND LONG-RANGE  
DAY BOMBER). VOISIN BIPLANE.—200 H.P. CANTON-UNNE  
LIQUID-COOLED RADIAL ENGINE. ONE OF THE FIRST AIR-  
PLANES TO MOUNT A LARGE SHELL-FIRING CANNON IT  
WAS USUALLY ARMED, AS SHOWN, WITH ONE MACHINE GUN



▶ 1915 BRITISH 2-SEAT FIGHTER  
VICKERS "GUN BUS".—100 H.P. MONOSOU-  
PAPE (SINGLE VALVE) GNOME ROTARY EN-  
GINE.—A SLOW BUT EFFECTIVE TYPE  
WHEN AERIAL COMBAT WAS LIMITED  
TO OCCASIONAL CHANCE ENCOUNTERS

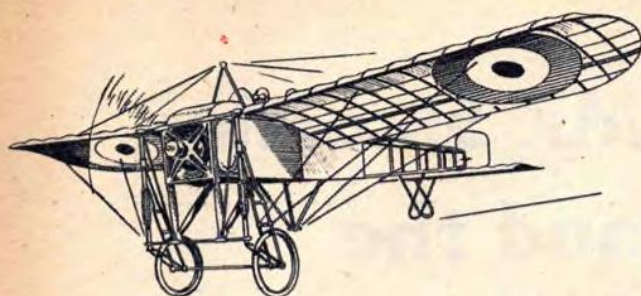
## THE MILITARY AIRPLANE (1914-18)

Although a few airplanes had been employed in the Balkan Wars of 1912, they served merely as unarmed and rather inadequate extensions of the tethered balloon, and it was not until World War I that the possibilities of the airplane as a combat weapon were realized. Development during this war was rapid, and at its close the airplane was firmly es-

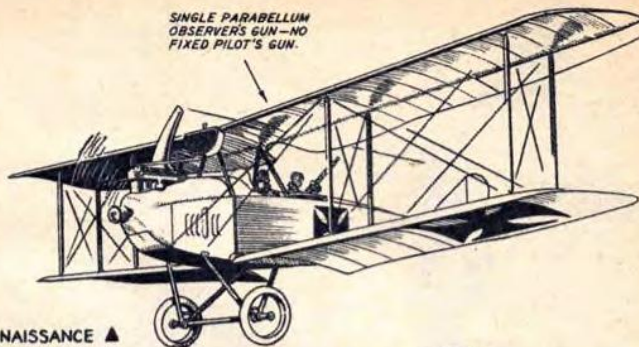
tablished as a formidable instrument of attack with roughly the same classifications and specialized tasks in vogue today.

Between the years 1914 and 1918 airspeeds rose from a dubious 60-85 mph to almost 150 mph, while armament, totally non-existent on the first military planes, steadily increased until all service planes were provided with both defensive and offensive weapons. Flares, rockets, cannon and multiple machine gun installations were in common use



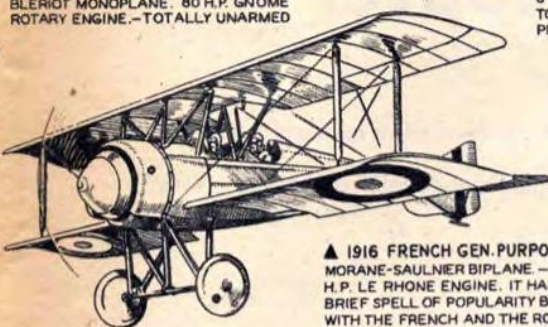


1914 FRENCH RECONNAISSANCE ▲  
(ALSO USED BY THE BRITISH AIR ARM)  
BLERIOT MONOPLANE. 80 H.P. Gnome  
rotary engine.—TOTALLY UNARMED



1915 GERMAN ARMED RECONNAISSANCE ▲  
L.V.G. BIPLANE. 160 H.P. BENZ LIQUID-COOLED  
6-IN-LINE ENGINE. ONE OF THE FIRST PLANES  
TO MOUNT THE ROTATING GUN RING WHICH COM-  
pletely revolutionized defensive tactics

SINGLE PARABELLUM  
OBSERVER'S GUN—NO  
FIXED PILOT'S GUN.



▲ 1916 FRENCH GEN. PURPOSE  
MORANE-SAULNIER BIPLANE.—110-  
H.P. LE RHONE ENGINE. IT HAD A  
BRIEF SPELL OF POPULARITY BOTH  
WITH THE FRENCH AND THE ROYAL  
FLYING CORPS BUT WAS UNSUITED  
TO THE MOUNTING AERIAL FIGHTING



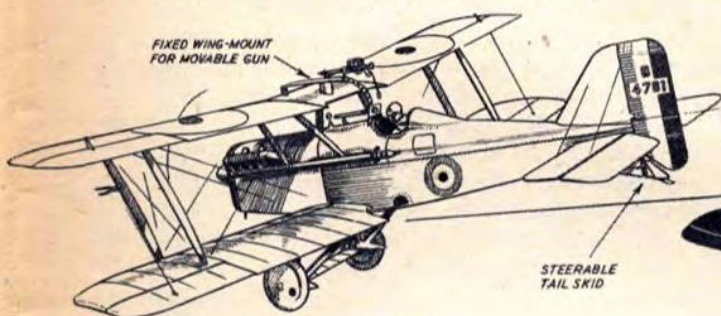
1917-18 BRITISH ARMED RECONNAISSANCE ▲  
R.E.8.—150 H.P. AIR-COOLED V-12 R.A.F. ENGINE.  
REPLACED THE EARLIER INADEQUATELY ARMED  
B.E. DESIGN AS STANDARD OBSERVATION PLANE

TWIN .30 CAL.  
LEWIS GUNS

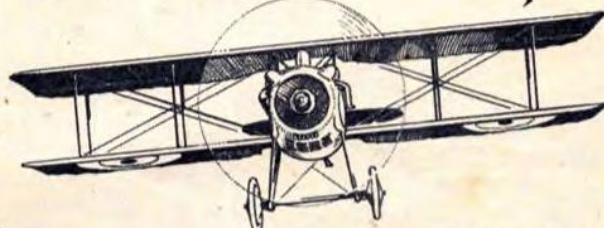
STEERABLE TAIL SKID

FIXED PILOT'S  
GUN LOCATED  
ON LEFT SIDE  
OF FUSELAGE

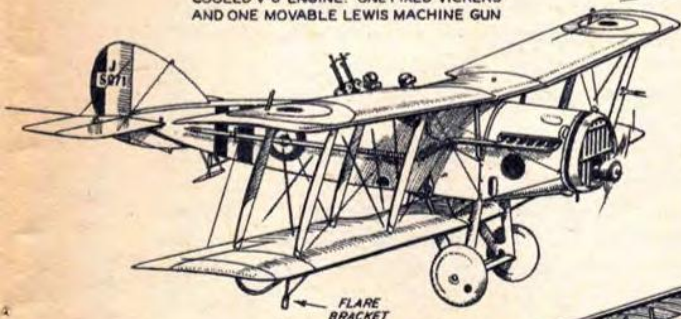
NOTE: ONE VERSION OF THE  
S.P.A.D. WAS FIRST CANNON-  
ARMED PURSUIT IN WORLD.



▲ 1917-18 TYPICAL BRITISH PURSUIT  
S.E.5. 150-200 H.P. HISPANO-SUIZA LIQUID-  
COOLED V-8 ENGINE. ONE FIXED VICKERS  
AND ONE MOVABLE LEWIS MACHINE GUN



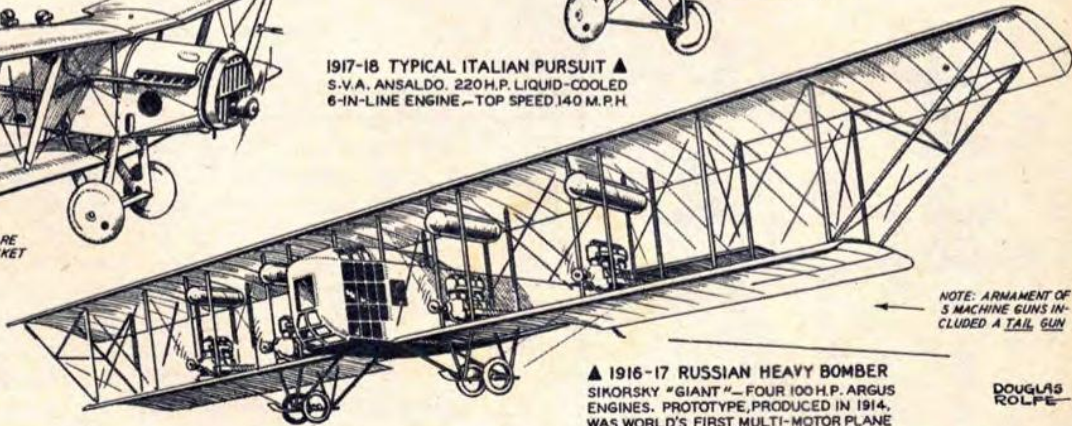
▲ 1916-18 TYPICAL FRENCH PURSUIT  
(ALSO USED BY THE U.S. AIR SERVICE, 1918)  
S.P.A.D.—180-235 H.P. HISPANO-SUIZA EN-  
GINE. MAXIMUM SPEED WAS 120-135 M.P.H.



1917-18 BRITISH 2-SEAT FIGHTER ▲  
BRISTOL FIGHTER. 275 H.P. ROLLS-ROYCE  
LIQUID-COOLED V-12 ENGINE. TOP 2-SEAT  
FIGHTER OF WORLD WAR I THE BRIST  
COULD OUTFLY AND OUTFIGHT THE BEST  
PURSUITS OF THE PERIOD AND WAS ARMED  
WITH ONE FIXED AND TWO MOVABLE GUNS



1917-18 TYPICAL ITALIAN PURSUIT ▲  
S.V.A. ANSALDO. 220 H.P. LIQUID-COOLED  
6-IN-LINE ENGINE.—TOP SPEED 140 M.P.H.



▲ 1916-17 RUSSIAN HEAVY BOMBER  
SIKORSKY "GIANT"—FOUR 100 H.P. ARGUS  
ENGINES. PROTOTYPE, PRODUCED IN 1914.  
WAS WORLD'S FIRST MULTI-MOTOR PLANE

NOTE: ARMAMENT OF  
S MACHINE GUNS IN-  
CLUDED A TAIL GUN

DOUGLAS  
ROLFE

by 1918; radio had replaced signal lamps by 1915.

In World War I design, the Germans favored heavy but reliable liquid-cooled engines, monocoque fuselages and swept-up or washed-out wing tips. The French were strong on steel tube airframes, used both liquid-cooled and radial air-cooled (rotary) engines. The British stuck to the old wood-wire construction, with all kinds of engines. Other countries, U.S.A. included, relied mainly on surplus French

and British types, though Russia designed the first multi-engine bombers.

Planes illustrated on these pages, running from left to right and from top to bottom, illustrate stages in the development of: unarmed reconnaissance and general-purpose planes, armed reconnaissance, typical pursuit types (single-seat fighters), two-seat fighters, fighter-bombers and one heavy bomber.





# Mr. Sikorsky and the Helicopter

**With present performance making big news, the  
"Daddy of the Eggbeater" discusses its future**

■ In Korea, the helicopter made a permanent place for itself in the table of equipment of our fighting forces, along with the jeep and the tommy-gun. Experimental airlines in Los Angeles and Chicago have indicated there is a worthwhile function for the "ambitious eggbeater" in our future society. This form of transportation that offers motion in any direction at respectable speed, that can bring airlift to our very rooftops, will ultimately have a real impact on the daily lives of all of us. But there still remain various unanswered questions—just what kind of helicopter, how big will it be, what functions will it serve—and when?

To learn what's in the next chapter, Air Trails went to the No. 1 pioneer and developer of the helicopter—Igor I. Sikorsky. Now engineering manager of the Sikorsky Division of United Aircraft Corporation at Bridgeport, Conn., this famed designer furnished the following answers to such questions as:

*What is the most important factor influencing the development of helicopters?*

Mr. Sikorsky: "Public acceptance. The science of rotating-wing aircraft has been developed to a status where we can build almost any kind of helicopter vehicle that civilization can actually use. There is no sense in forcing the issue. If some progressively eccentric billionaire were to order ten thousand four-place helicopters, they could be built for the price of a fixed-wing airplane. However, the first serious accident involving more than just the occupants of the machine would make helicopters more enemies than months of sensible operation could compensate. The best approach is to let the helicopter find its own way, for the public to create its own uses for this highly flexible means of transportation.

"Then civilization will have an opportunity to reshape its pattern of living around the new (Continued on page 62)



Igor I. Sikorsky

By WM. S. FRIEDMAN





By FRANK TINSLEY

## Ahead of His Time

BILL BARNES—PROPHET

*In combat readiness above is the last plane designed by Bill Barnes, the 1938 Charger, forerunner to today's long-range twin-engine multi-place fighter. The three-place craft incorporated, even then, radio navigation, amphibious gear, buried diesel engines of 1,800 hp each. A distinct innovation was the single-blade propellers. Wings and tail surfaces were of stainless steel; fuel load in integral wing tanks.*



Bill Barnes, Air Adventurer

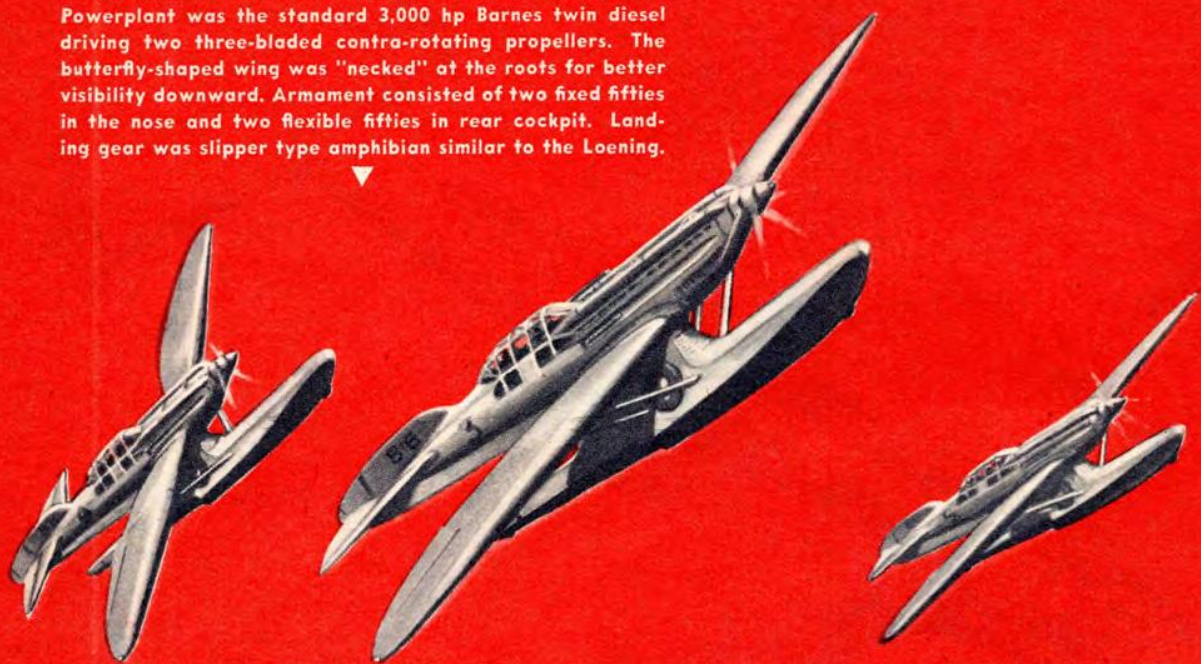
■ Bill Barnes, whose adventures were recorded in the pages of *Air Trails* from 1934 to 1938, was ahead of his time in many ways—as a designer, pilot and inspired aerial tactician. His planes not only foreshadowed those of today in many technical details, but the tactical philosophy on which they were based has also proven prophetic to an amazing degree. The secret of Bill Barnes' brilliance lay in his unique background and personality. To an eternally questioning mind and practical mechanical imagination he added the know-how of the combat flyer and the hard-boiled savvy of the trained engineer. His service in World War I had taught him all the tricks of the fighting pilot's trade, as well as a vital awareness of the airplane's faults and limitations.

In this presentation of the Bill Barnes planes, we have limited ourselves to the final flowering of the fleet—the culminating models of each of his types. Space limitation forbids a more detailed description of each plane. We have, however, tried to give you an accurate pictorial idea of the ships, plus solid model plans taken from the original blueprints.

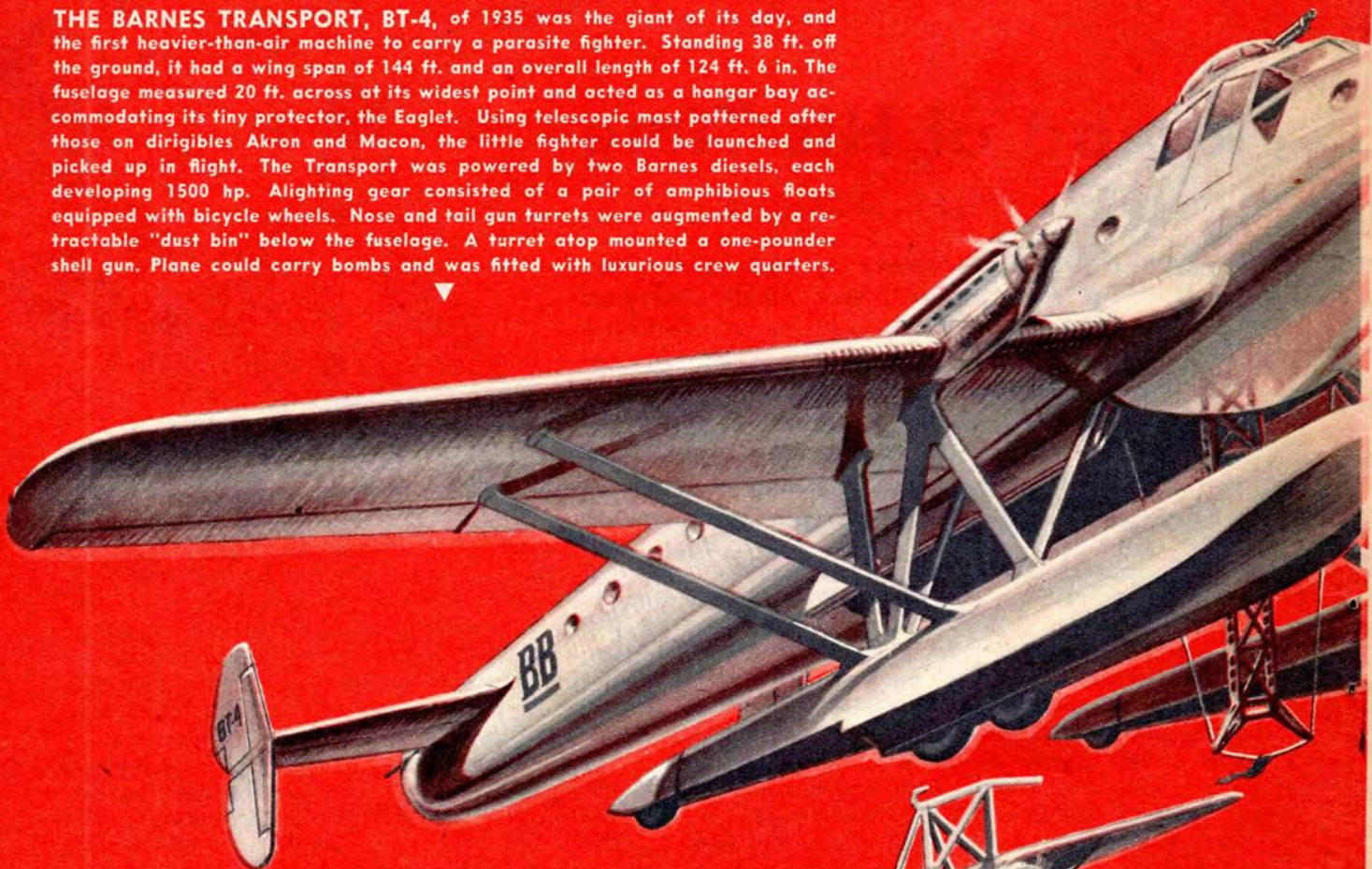
As a final point: Many of our readers have wondered, many have written in to ask—where is Barnes now? Here is as much as we are permitted to tell. In 1947, Bill disappeared while on a confidential mapping mission somewhere west of the Bering Sea. For a long time the public believed him dead. Recent reports have him very much alive, and a part of the guided missiles program.



**IMPROVED SNORTER, BF-4D**, joined Bill Barnes' fleet in 1936 and was the fourth of his basic two-seater fighters. Powerplant was the standard 3,000 hp Barnes twin diesel driving two three-bladed contra-rotating propellers. The butterfly-shaped wing was "necked" at the roots for better visibility downward. Armament consisted of two fixed fifties in the nose and two flexible fifties in rear cockpit. Landing gear was slipper type amphibian similar to the Loening.



**THE BARNES TRANSPORT, BT-4**, of 1935 was the giant of its day, and the first heavier-than-air machine to carry a parasite fighter. Standing 38 ft. off the ground, it had a wing span of 144 ft. and an overall length of 124 ft. 6 in. The fuselage measured 20 ft. across at its widest point and acted as a hangar bay accommodating its tiny protector, the Eaglet. Using telescopic mast patterned after those on dirigibles Akron and Macon, the little fighter could be launched and picked up in flight. The Transport was powered by two Barnes diesels, each developing 1500 hp. Alighting gear consisted of a pair of amphibious floats equipped with bicycle wheels. Nose and tail gun turrets were augmented by a retractable "dust bin" below the fuselage. A turret atop mounted a one-pounder shell gun. Plane could carry bombs and was fitted with luxurious crew quarters.



**THE EAGLET**. Originally inspired by the tiny Curtiss "Sparrow Hawk" of dirigible fame. Had folding wings for internal stowage; was equipped with retractable amphibian gear and enclosed cockpit. Engine was a radial of 830 hp. Plane went into service with the Barnes fleet in 1935. Could withstand a 450 mph dive.

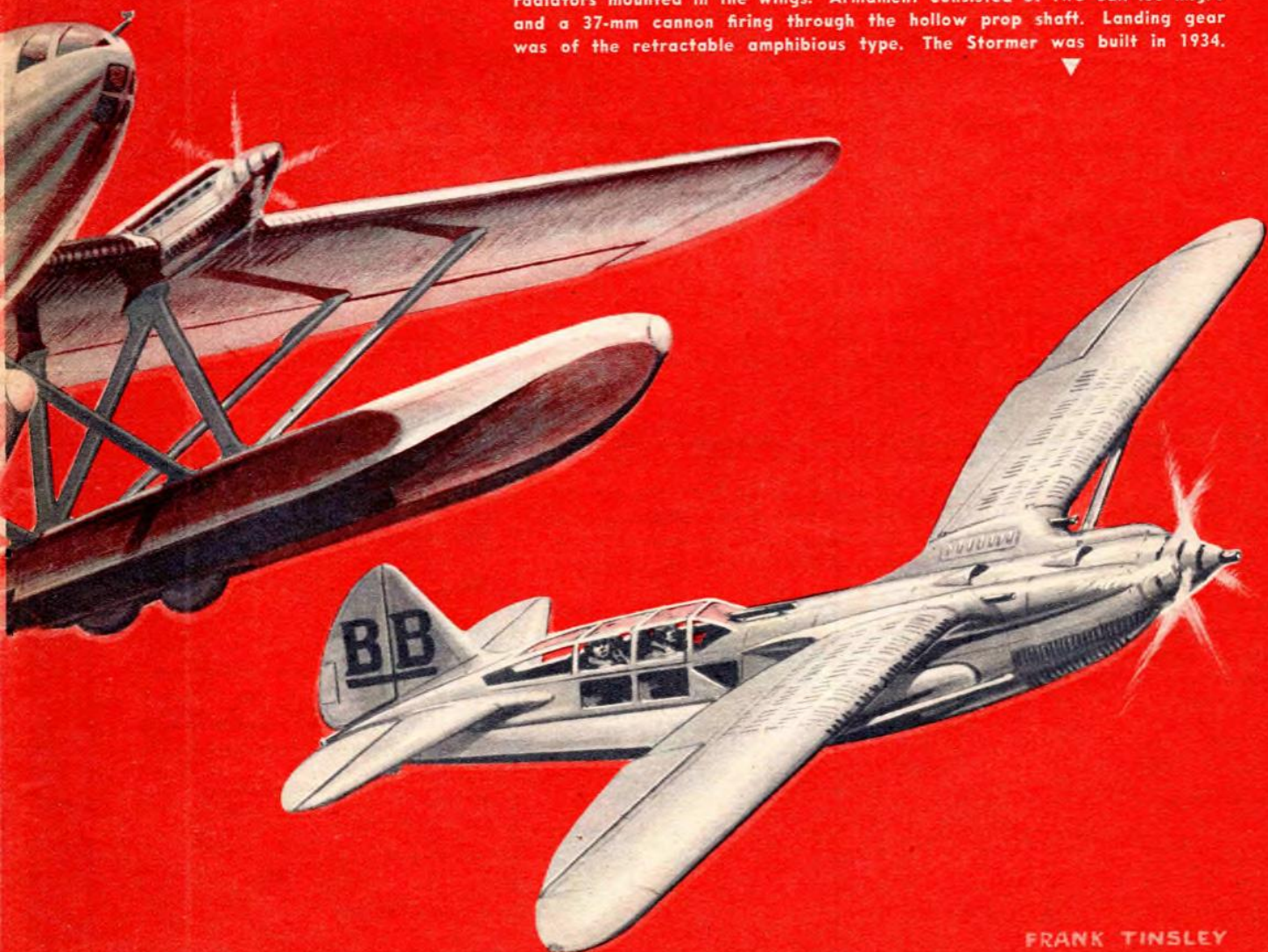




**THE SILVER LANCER, BF-7A**, built in 1936, was the first of Bill Barnes' planes to have a cantilever wing. It was equipped with a retractable amphibian gear consisting of large central float upon which were mounted two stub wings with tip floats housing the wheels. Although ungainly looking with gear extended, the plane became a fast, efficient two-place fighter when the float was raised. It had a 37-mm cannon firing through the prop shaft, two fifties in front and two .30's in rear.



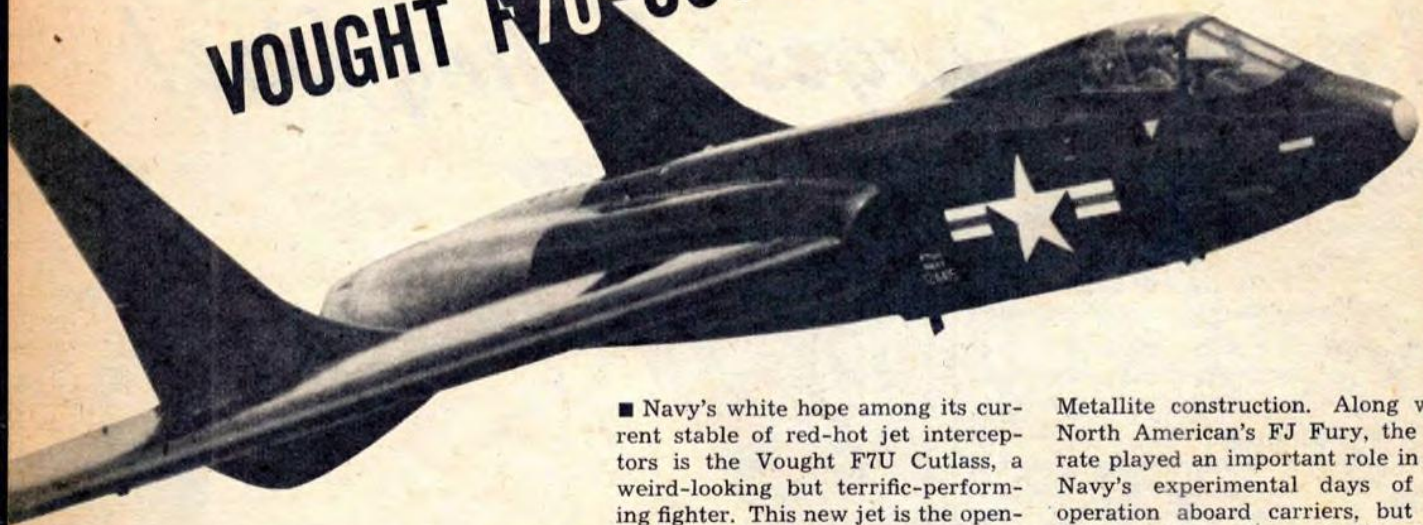
**THE SCARLET STORMER, BF-6A**, was the first fighter designed especially for Bill Barnes' personal use. Anticipating present-day "all-weather" fighters, it carried a copilot/radio operator in its enclosed, pressurized cabin. To increase combat visibility a gulled shoulder wing of butterfly planform was utilized. Engines were two liquid-cooled V-12's hooked up end-to-end driving two contrarotating props. Engine cooling was supplied by skin-type radiators mounted in the wings. Armament consisted of two cal. .50 m.g.'s and a 37-mm cannon firing through the hollow prop shaft. Landing gear was of the retractable amphibious type. The Stormer was built in 1934.



FRANK TINSLEY



# VOUGHT F7U CUTLASS



**Step-brother to the Flying  
Wing, blood brother to an angry  
rocket, this novel Navy  
fighter will play a big role in  
America's air effort**

■ Navy's white hope among its current stable of red-hot jet interceptors is the Vought F7U Cutlass, a weird-looking but terrific-performing fighter. This new jet is the opening wedge in the Navy's assault on the enormously complex problem of operating the transonic fighter from a carrier deck—but most of the solutions are already clear: it *can* be done!

The Cutlass is the Navy's first swept-wing combat airplane and represents Chance Vought's bold bid for leadership in this exciting but difficult new field. Navy's first wave of jet carrier fighters stuck religiously to the straight wing with its well-known high-lift and good stalling characteristics. McDonnell's successful FH Phantom and F2H Banshee and Grumman's sleek F9F Panther all followed this dependable planform in to long production lines. Chance Vought entered the new jet field in September 1946 with its F6U Pirate single-jet fighter featuring

Metallite construction. Along with North American's FJ Fury, the Pirate played an important role in the Navy's experimental days of jet operation aboard carriers, but the F6U never saw the production line.

The No. 3 Pirate was used in a forward-looking experiment, however—the application of the Solar afterburner to the Westinghouse J34 turbo-jet engine. This simple shell of stainless steel provided an increase in thrust of 30 percent for take-off and 50 percent at best altitude and speed. Flight tests with this Pirate proved that here was an extremely light and simple device which Navy and Vought engineers could not overlook in future design—and that meant the F7U Cutlass!

This deadly new interceptor began life way back in January 1946 (nine months before the F6U had flown!) when the Navy Bureau of Aeronautics invited bids on a 600-mph, 40,000-ft. interceptor. Vought, Grumman, (Continued on page 68)

**In the Cutlass the Navy has a formidable weapon with a rocket-like climb. Note high angle of attack plane assumes on the ground.**





# MIG - 15

## RUSSIAN JET FIGHTER

Scale  $\frac{3}{16}$ " = 1'0"

Navig. lights

Pressurized cabin  
with Ejector Seat

Unidentified  
Gadget

Radio  
mast

L.g. doors

Shock travel

Baffle plate

Bulge

Flaps

Tail  
Bumper

Note:  
Small torpedo  
shaped fairing  
at stabilizer-  
fin joint

Air Brake

Engine  
location

Filler  
Caps

Color Scheme:  
Polished aluminum  
with red stripes  
outlined in white

Engine:  
One Russian built  
Rolls-Royce "Nene"  
centrifugal-flow  
gas turbine with  
5000 lbs. thrust.

Pilot on  
right side  
only

Baffle plates

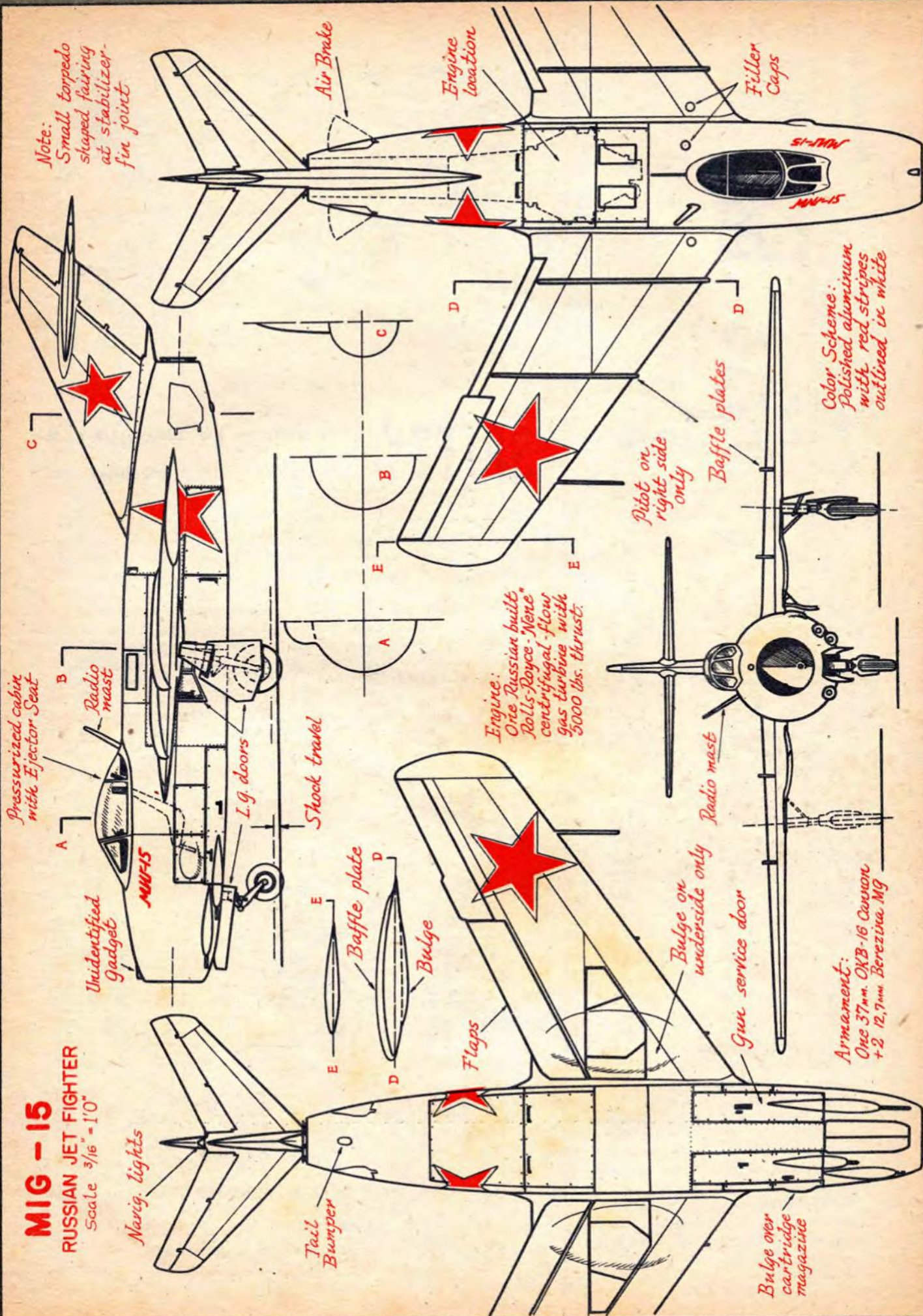
Radio mast

Bulge on  
underside only

Gun service door

Armament:  
One 37mm. OXB-16 Cannon  
+ 2 12.7mm Berezina MG

Bulge over  
cartridge  
magazine





# AIR TRAILS

APRIL 1951  
25 CENTS

*Special this Issue!*

**YOUR PLACE IN  
AMERICA'S ALL-OUT  
AIR EFFORT**

*Official Reports for—*

**SPOTTERS ★ YOUTH GROUPS  
OBSERVERS ★ MECHANICS  
PILOTS ★ GROUND CREWS  
WOMEN IN THE INDUSTRY**

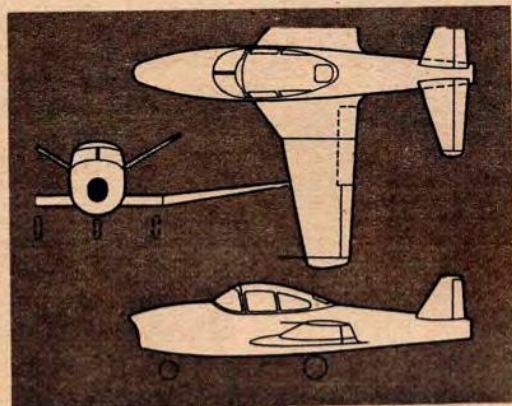
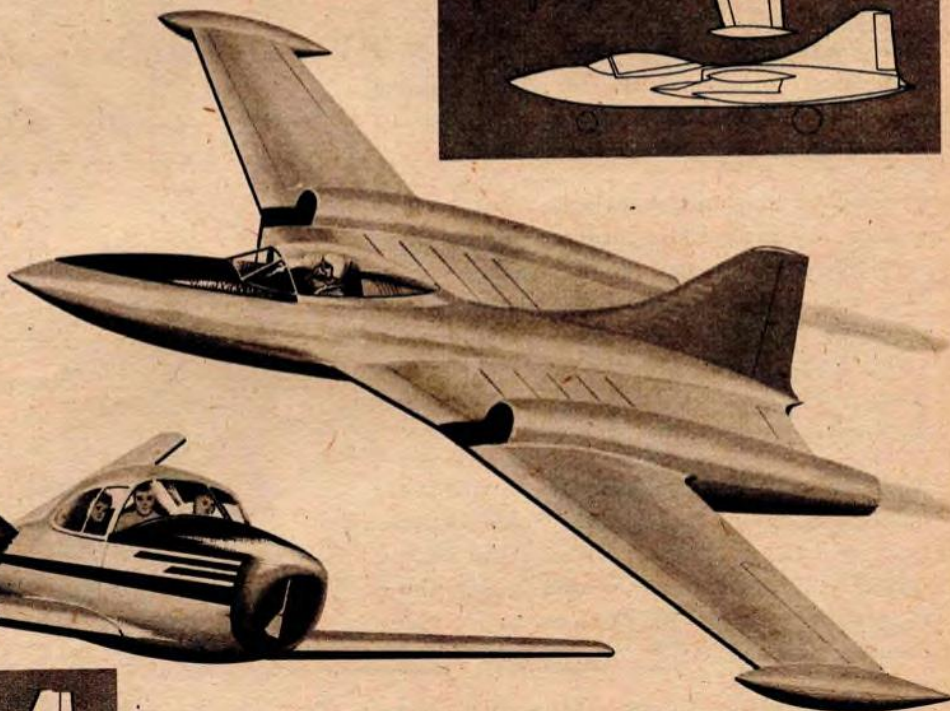




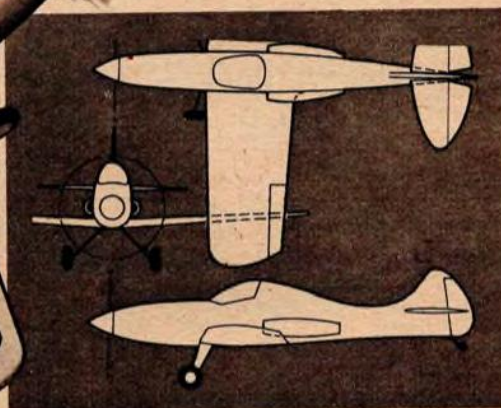
# Airmen of Vision

## DESIGN COMPETITION

Top of this list this month is Bill Muir of Chicago, Ill., with design of an All-Weather twin jet fighter equipped with such advanced features as boundary layer control. A pump in fuselage sucks air from slots in center section, giving plane increased lift. Engines develop 1600 lbs. of thrust each and in addition are equipped with afterburners. Maximum speed is 640 mph at 30,000 feet. Span 38.5 ft.



R. J. Raymond of Chicago, Ill., comes up with an unusual 190 cu. in. displacement midget racing plane. The engine of ship is located behind the pilot, driving a propeller through a long shaft. Very interesting and makes for excellent streamline, but presents a sticky problem in balancing. Also, experience with long extension shafts has not been very happy. Cooling is through ducts at side of fuselage.



Here's a neat personal plane powered by a jet engine by Paul W. Berlo of Gardner, Mass. It is well-balanced design and one which should have a good performance and flying characteristics. It is well adaptable to small jet engines as produced by Boeing here in USA or Fouga in France. All-metal construction. Span 32', length 28'.

Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

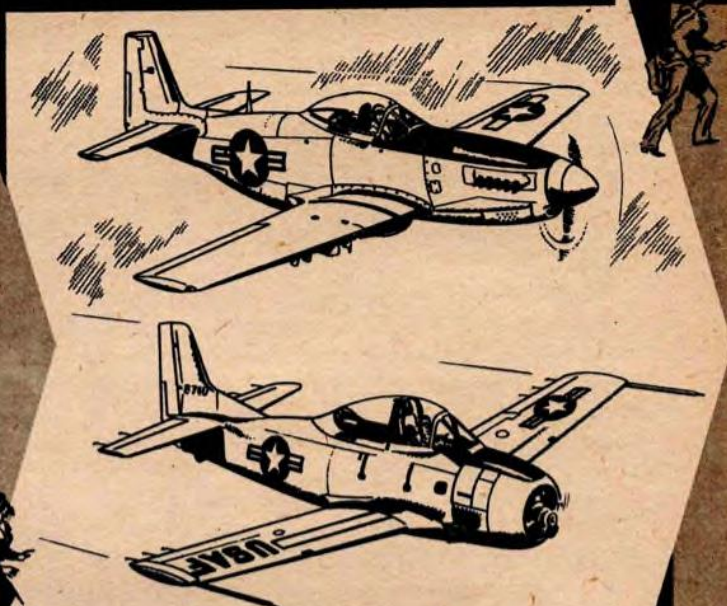
judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



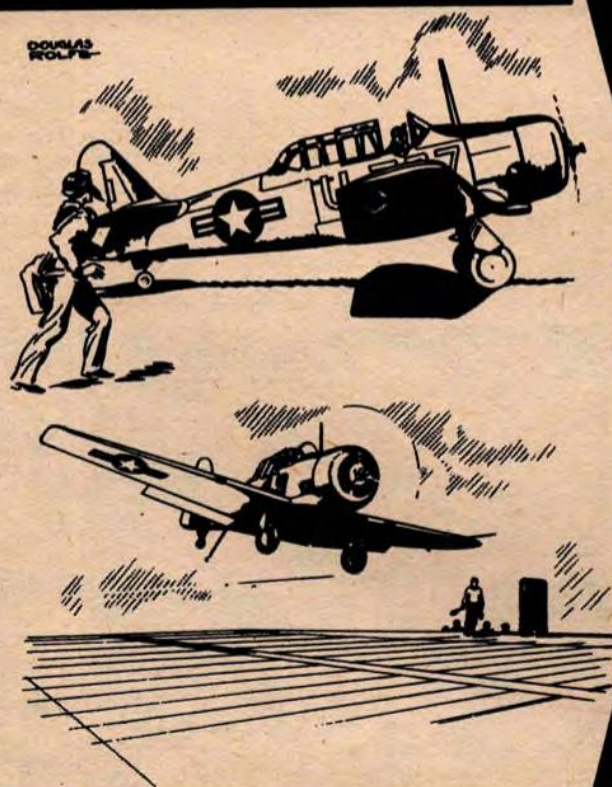
# MILITARY PILOT TRAINING



BASIC. T-6, 130 HRS.



ADVANCED 1-ENGINE. T-38, 70 HRS.; FT-51, 65 HRS.



BASIC. SNJ, 173 HRS., INCLUDING CARRIER QUALIFICATION



ADVANCED CARRIER TRAINING. F4U, F8F OR AD, 108 HRS.



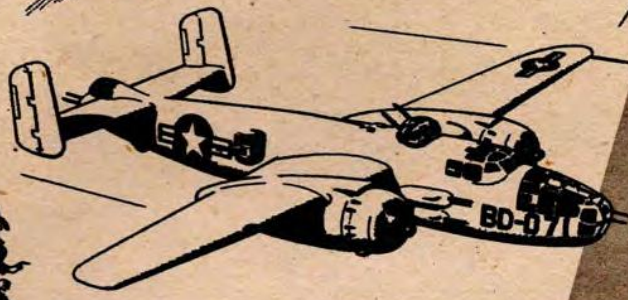
ADVANCED PATROL PLANES. PBM, PB4Y OR P2V, 137 HRS.

It's a long cry from the last war-time training of an aviation cadet to present-day methods. No longer does the student have to go through the primary, basic and advanced stages in strictly training type ships such as the PT-17, BT-13 and AT-6. (Navy SN2S, SNV and SNJ). Nowadays, as soon as he is selected for flight training, he enters the basic stage and green as he may be, is given instruction in the North American T-6 (SNJ) which, only a short time ago, was considered an advanced type. The Air Force gives 25 hours of dual time in the plane and the remainder of the basic course, 105 hours, includes maneuvers, night flying, navigation, instrument flying and aerobatics. Added to that is 154 hours of ground training. Basic course takes 28 weeks. Graduating from the basic course, the cadet has a choice to qualify for the single-engine conventional, single engine, jet or multi-engine advanced course





ADVANCED JET. T-28, 70  
HRS. T-33 & F-80, 65 HRS.



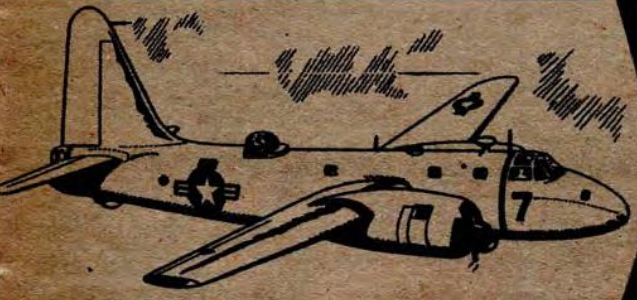
MULTI-ENGINE. T-28, 70  
HRS. TB-25, 65 HRS.



ADVANCED CARRIER QUAL-  
IFICATION. 12 HRS.



ADVANCED JET. TO-1,  
25 HRS.



STUDENTS QUALIFY AS  
PILOTS AND CO-PILOTS



SELECTED PILOTS ARE  
TRAINED FOR CATAPULT DUTY

where he gets 135 hours of flight training in types of aircraft illustrated here, plus 180 hours of ground school. After 24 weeks in the advanced stage he is eligible for his pilot wings. He also receives in each course 107 hours of academic training in aircraft and flight operations, gunnery, weather and communications, and 215 hours of officer training.

If he chooses the Navy, he will get 22 hours of dual and 151 hours of solo in an SNJ in a basic course. Including basic training, it takes 293 hours and 72 weeks to graduate as single engine conventional plane pilot, 328 hours and 76 weeks to become a jet jockey, and 310 hours and 43 weeks for the multi-engine course. In addition, naval cadets qualifying for single-engine rating are required to take 1454 hours of ground training, and those in multi-engine course, 1391 hours.



# AIR TRAILS

MAY 1951 • 25 CENTS



*Starting this Issue!*

Complete, behind-  
the-curtain report:  
**RUSSIA — Colossus  
of the Air!**



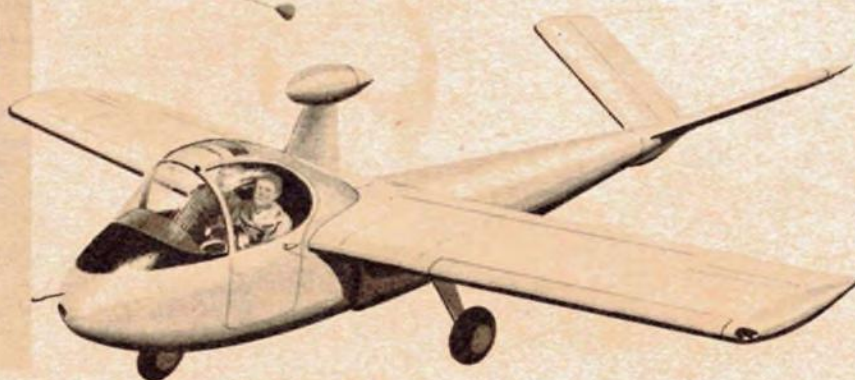
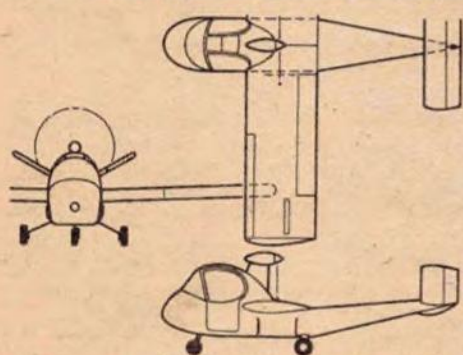
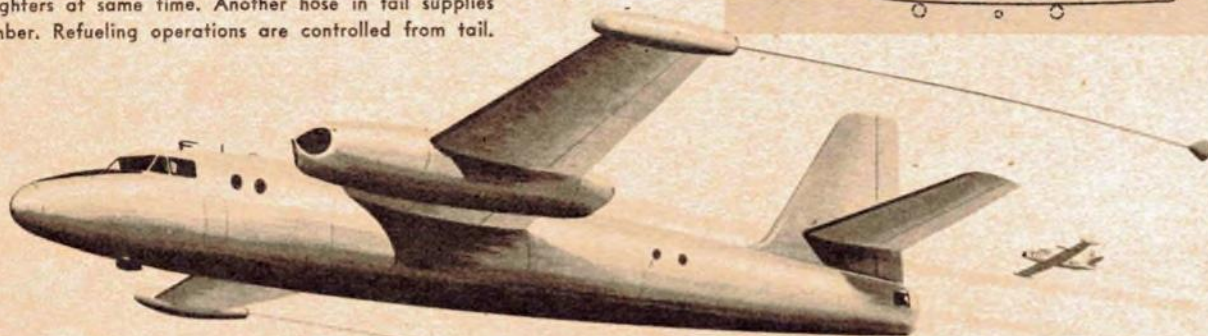
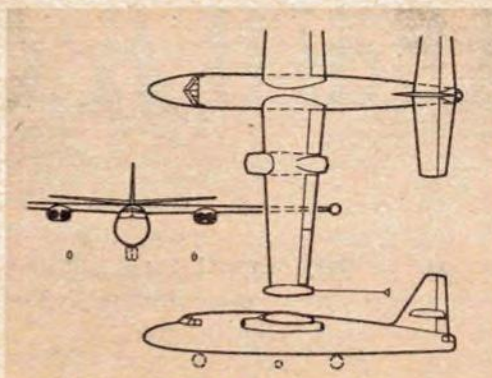
S. CALHOUN SMITH



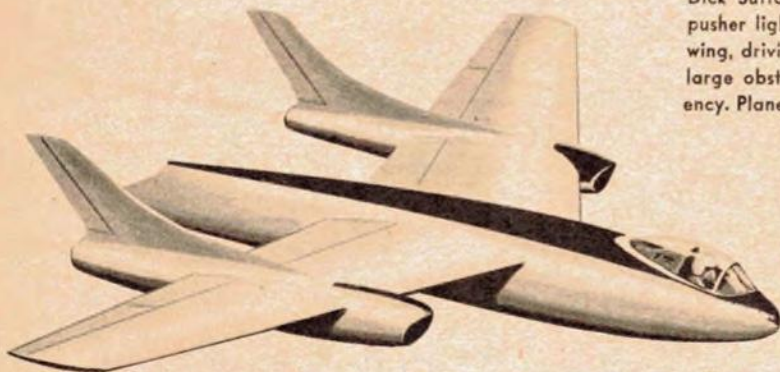
# Airmen of Vision

## DESIGN COMPETITION

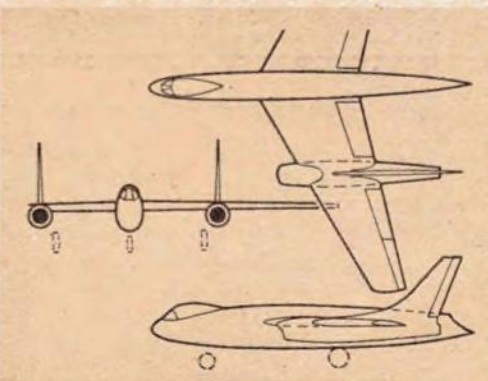
Here's a first-class idea by Warren Pollington of Inglewood, Calif.—a jet-powered tanker for air-to-air refueling. Fuel is carried in hollow box spars of wings, with additional tanks in fuselage. Refueling equipment housed in wingtips. Plane is designed to refuel two jet fighters at same time. Another hose in tail supplies gas for a bomber. Refueling operations are controlled from tail.



Dick Sutton of Lawrence, Kans., submits a design for an unusual pusher lightplane in which engine is located in fuselage, below the wing, driving an overhead propeller through extension shaft. Lack of large obstruction, such as an engine, greatly increases prop efficiency. Plane has crosswind landing gear. Spoilers supply rolling action.



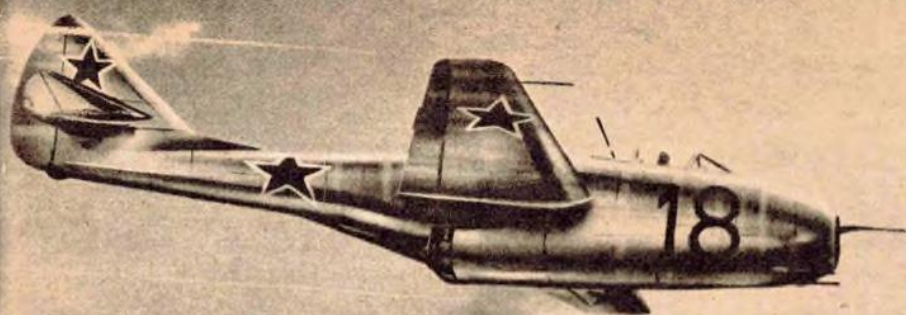
The Rattler, a high-speed twin jet interceptor by Robert R. Bruton of Fort Worth, Tex. Forward location of cockpit gives pilot excellent visibility. The two turbo-jet powerplants supply 5,200 lbs. of thrust each. Plane is capable of speeds between 750 and 800 mph. Landing gear is bicycle with auxiliary wheels carried in engine nacelles. Wing span 48 ft., length 36 ft. Armament consists of four 20-mm cannon.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





# AIR TRAILS

MAY, 1951



The first Russian fighter to be designed for jet power, the MIG-9. Engines are two underslung M-003 axial flow. Top speed 595 mph.

## Russia—Colossus of the Air PART 1

**Most comprehensive, startling report yet: training, jet progress, operation, naval arm and all phases**

■ The paralyzing uncertainty that is dominating the Western World is a fire fed by concern over the awe-inspiring air potential of the Soviet Union. Russia looms as a greater menace to their security than the countries participating in the North Atlantic Alliance have ever had to face. Few Western Europeans or North Americans now ignore this fact, and most realize that some drastic action must be taken to counteract the threat of barbaric invasion and slavery. The whole Soviet empire is organizing as a single entity to maintain the greatest military forces ever assembled by one government, and of these, the Soviet Air Force is perhaps the most vital part.

Every indication is that the majority of Russian air formations are still tied to the Red Army and are, in fact, an integral part of the steamroller ground forces. If the West can blunt Soviet air power, it also slows the advance of the Red armored divisions and, incidentally, lessens the risk of Russian domination of the seas. Great importance therefore attaches to a correct appreciation of the strength, role and final effectiveness of Russia's air arm, so that the Western World may forge an air weapon which will neutralize

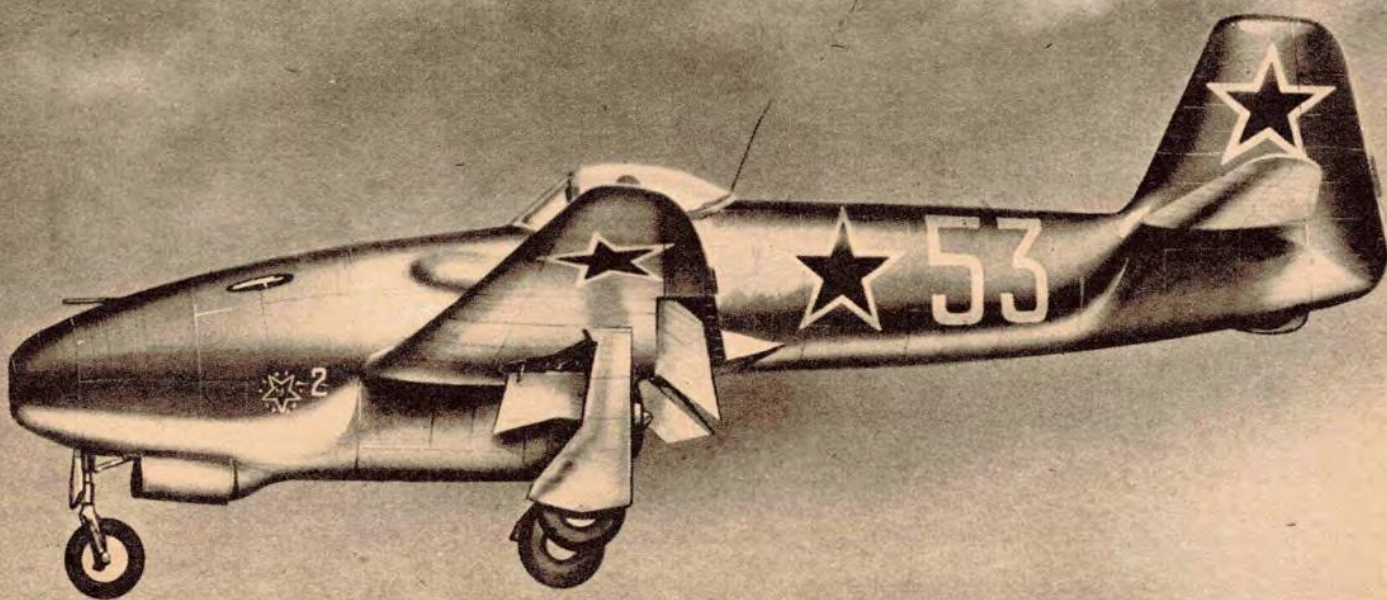
By "ARGUS" and later destroy completely the last vestiges of the Red air armada.

During the years of World War II, main Russian productive effort was concentrated on vast manufacture of strictly orthodox aviation equipment. Aircraft types were functional and accent was placed on rapid availability; in some cases production simplicity taking precedence over fullest fighting efficiency. Combat machines were reduced to a few simple types which proved highly efficient for their particular roles but, as the war drew to a close and increasing quantities of the latest Luftwaffe equipment fell into their hands, the Russians had brought home to them with great force how very far behind they were in almost every branch of military aviation science.

In 1945, the Soviet Air Force was a very fourth-rate organization indeed. It has taken the Russians over five years of accelerated research, with a very great deal of German assistance, to make up the leeway.

At the present time the whole equipment position is in a transitional stage. Several excellent jet-propelled types have appeared and been placed in large-scale production after a period of immense





Latest version of YAK-15 is equipped with tricycle gear. Fin and rudder were redesigned. Engine is axial flow M-004, top speed 505 mph.

difficulties with the new jet powerplants, with high-speed aerodynamics, electronics, new tactics and strategic conceptions, and all the other techniques and apparatus developed by other powers during the fertile war years. Latest Red swept-wing fighters and jet bombers in production should acquit themselves well against the best service machines of other nations. On the other hand, a large percentage of air regiments are still equipped with piston-engined types serving at the end of the war, or built since 1945; which matters little to the Russians at the moment as the air forces of the Atlantic Pact countries have nothing to oppose these while engaging the newer types.

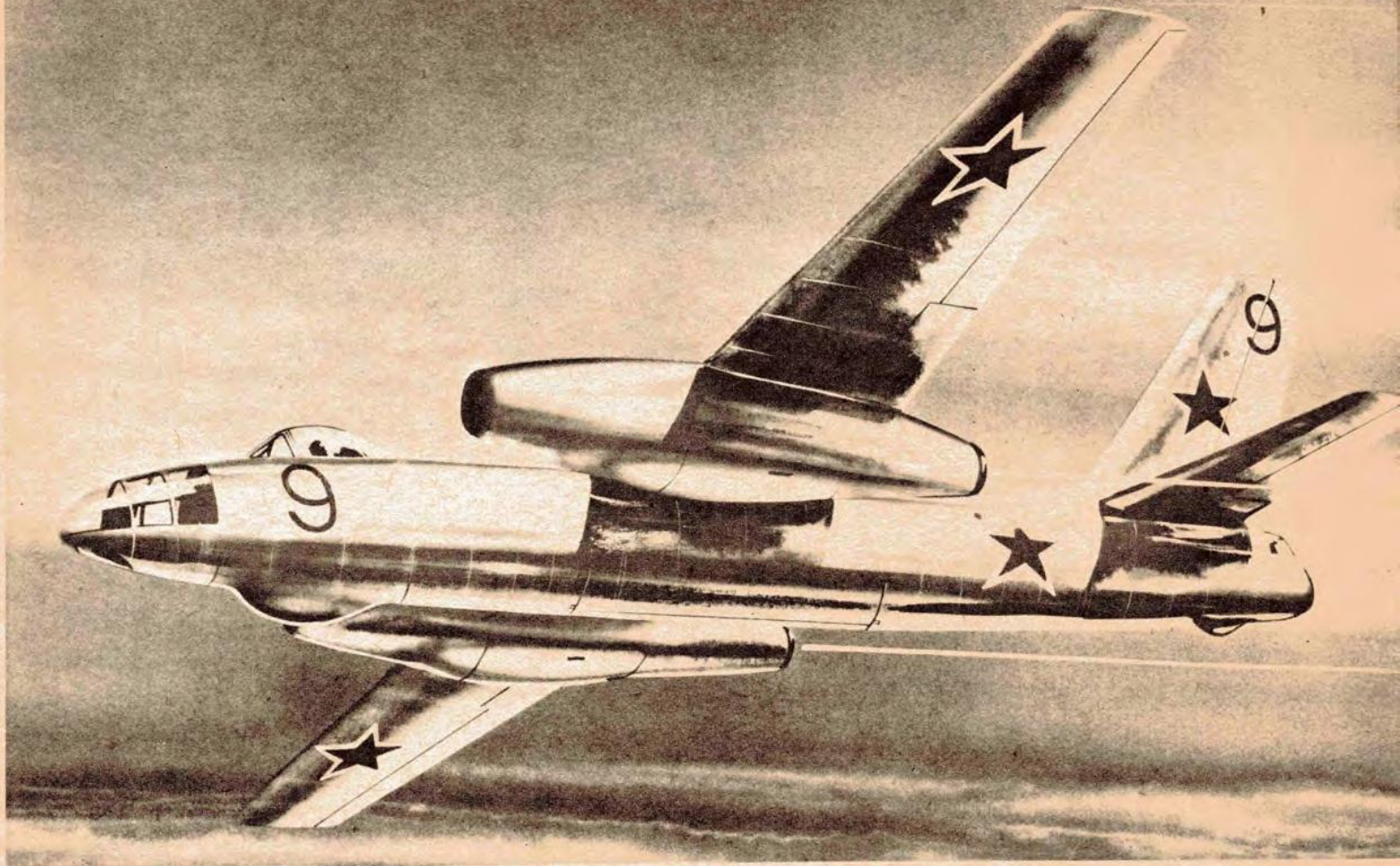
Combat strength of the Soviet Air Force, estimated officially as between 15,000 and 20,000 first-line aircraft, is only the centerpiece of a vast structure started long before the last war whereby the whole Soviet sphere of influence is being made air-minded to an unprecedented degree. The foundations of this giant edifice of air power lie in the mass training of aviation industry apprentices, conscripted in their early teens to man the numerous aviation colleges and technical schools. This fund of industrial engineers and minor technicians is drawn from the still larger pool of members of the aviation branch of the DOSAV organization, which gives elementary training in airplane modeling, gliding, powered flying, parachuting, and instruction in the rudiments of aviation science. Thus, personnel are in the process of being bred al-

most from childhood to man a vast aviation industry.

From DOSAV is also drawn the main stream of recruits for the Soviet Air Force and the Army airborne forces. Lack of suitable manpower is the last thing that should worry the Soviet Union in a large-scale clash between East and West. A factor that is more likely to limit the size of the Soviet Air Force is manufacturing capacity for aircraft and allied equipment. Soviet wartime production was far outdistanced by the phenomenal British and American output, but whereas the democratic countries have reduced production to a tiny proportion of wartime capacity, the Soviet Union has increased not only her potential but her actual aircraft output compared with wartime figures. Nevertheless, Russia is unlikely to embark upon any war that they think will last long enough to allow Anglo-American productive capacity to attain a wartime footing. The danger is that our numerically inferior forces will be swamped in the first onslaught.

The quality, as distinct from the size, of the Soviet Air Forces is of great, but not overwhelming, significance. Examination of various modern Russian civil aircraft, which occasionally fly out from behind the Iron Curtain, leaves little doubt that the quality of workmanship in Russian airframe factories is not markedly inferior to the average standard set in the West. The main qualitative differences are to be found in engines and miscellaneous aviation equipment.





Believed to be designated TU-10, this twin-jet is tactical bomber. Notable here is the straight, square cut-wing and swept-back tail unit.

Russian designers have both big advantages and grave disadvantages compared with their counterparts elsewhere. In the first place, where they enjoy the confidence of their political and industrial superiors they can call on every possible assistance with their work, including the use of numerous fine government experimental establishments with full wind tunnel equipment. On the other hand, if they are unlucky enough to initiate any new equipment, theory, or technique which is unsuccessful or is not in accord with official views, they risk a damaged reputation and even loss of liberty. The result is bound to be the constant throttling of originality which, after the war, caused a major crisis in Soviet aviation affairs. Then, German research material and technicians, British and German turbo-jets, had to be acquired with frantic haste in an effort to match the technical superiority held by the other great powers.

Unfortunately, although this tendency toward orthodoxy may continue and, in time, do irreparable damage to Soviet aviation, at the moment the Russians are easy leaders in the intensifying race for air superiority by virtue of their vast numerical strength.

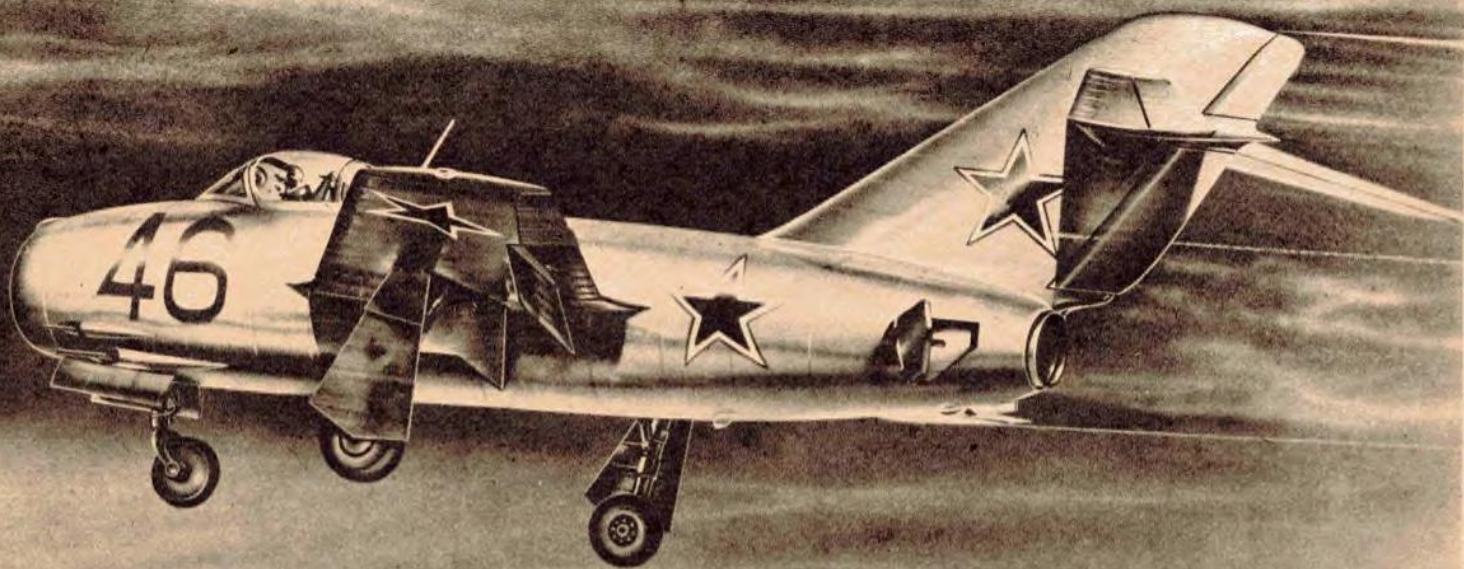
Apart from the top-line designers, the lower ranks of technicians are still sub-standard and under strength; first fruits of the giant government training scheme mentioned earlier being enjoyed, however, as the flow of students from the aviation institutes into the Air Force and industry increases.

Important among the numerous technical institutes and colleges is the Zhukovski Air Engineering Academy, the ace Soviet research institution and training ground for picked aircraft designers, radio, radar, engine, armament and other specialists. Technicians trained here eventually find their way into top positions in the Soviet Air Force and aviation industry. Other important academies producing key personnel for aviation and allied industries are: the Moscow Aviation Institute, the Aviation and Technological Institute and the Kharkov Aviation Institute, and numerous smaller civil research and training schools.

The Soviet Air Force itself runs both officer training institutes, such as the Air Force Academy, near Moscow, from which come many of the Air Force commanders and which has a large hand in the evolution of new air tactics and strategy, and engineering and research institutes, such as the Riga Air Force Engineering College and the Kuibyshev Military Engineering Academy, which specialize in the training of maintenance and auxiliary equipment experts and building and constructional engineers.

Russian designers are aided by a number of German technicians who have settled in Russia. The status of these Germans is not clear. Many are receiving excellent pay and certain privileges to keep them in Russian employ; others less willing to go to, or stay in, the Soviet Union are doubtless forcibly held there under close supervision. It may be that the ideology and principles of the German aircraft





MIG-15 flown on Korean front by Chinese Reds is also in service in Eastern Germany. Wing sweep is 35°. Note dive brakes below tail.

technicians were diametrically opposed to Communism, but ideologies have a habit of going by the board when it comes to a choice between their retention in acute discomfort and their refutation in comparative ease and luxury, and there is much evidence to show that most of the latest Soviet aviation developments are the result of combined Russo-German brains.

#### **Turbojets, Weapons, Radar/Radio**

A dangerous bottleneck in the supply of jet combat airplanes for the SAF is the small output of reliable gas turbines. There is as yet no intimation that the Reds have succeeded in producing a turbo-jet of original design; all production engines being based on German axial-flow designs by Junkers, B.M.W. and Heinkel-Hirth and, reportedly, the Rolls-Royce centrifugal-type Nene unit, a quantity of which were supplied to Russia by the British Government at a time when international relations were still officially cordial.

The first effects in the jet engine field of the influx of German knowledge and technical assistance, both theoretical and practical, were the production of Russian versions of the Junkers Jumo 004B and B.M.W.-003 axial-flow gas turbines which were, at that time, giving 1,990 lbs. s.t. at 9,500 rpm, and 1,890 lbs. s.t. at 8,700 rpm, respectively. Simplified, from the production standpoint, and prepared for Soviet manufacture by Engineers Svetzov and Chelomey, the units were redesignated M-003 and M-004 and installed in Russia's first jet fighters, the single-jet Yak-15 and the twin-jet MIG-9, to be described later.

In both of these airplanes the turbo-jets are slung under the fuselage nose in order to simplify their removal for maintenance. This layout was found to be necessary as, in the case of the Jumo 004B, the whole power unit had to be stripped for cleaning and overhauling of the compressor and for detailed inspection of the turbine wheel and combustion chambers after only 30 hours' running. However, this work was remarkably simple and could be undertaken by relatively unskilled women.

Neither the M-003 or M-004 is a suitable unit for development to give much above 2,500-3,000 pounds' thrust, and concentrated development is being given to the more powerful units by the same designers, the Jumo 012 and B.M.W.018, which were in more transitory stages when taken over by the Russians. However, very great difficulties—also encountered in other countries—regarding the metallurgical aspects, methods and standards in the mass production of such axial-flow units have been, and still are being, encountered.

The B.M.W.018 was designed to give a thrust of 7,520 lbs. at 6,000 rpm, and the Jumo 012 was to have a thrust of over 6,000 pounds. Nothing is known of the stage reached in the development of the M-018 (as the B.M.W.018 is now known) but reports indicate that the Russians have at last placed the Jumo 012 in quantity production. Redesignated M-012H, this unit is at present giving a static thrust of about 4,000 lbs. at 9,000 rpm, but the unit is exceptionally long (177 inches) and bulky, and, owing to the extensive use of steel, the dry weight is some 4,750 pounds—nearly twice that (*Continued on page 55*)



# USSR AIR FORCES vs. ATLANTIC



MIG-15



LA-17



LA NIGHT  
FIGHTER



YAK-17



YAK-15



TU-8



TU-2



PE-2



LA-11



TU-4



IL-16



IL-24 (7)



IL-18



YAK-16

IL-12



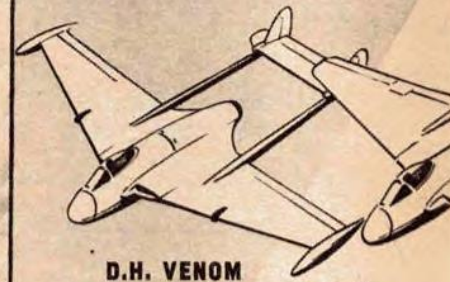
SUKHOI



YAK-14



BRATUKHIN



D.H. VENOM



HAWKER  
P. 1081

DASSAULT  
OURAGAN



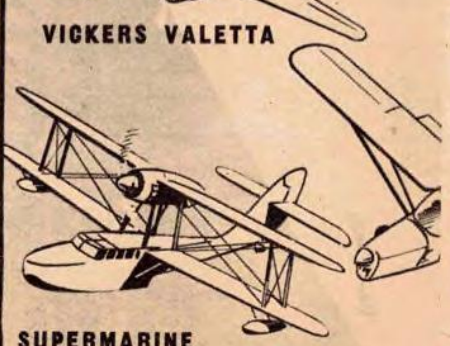
WESTLAND  
WYVERN 2



ENGLISH ELECTRIC  
CANBERRA



AVRO  
LINCOLN



VICKERS VALETTA

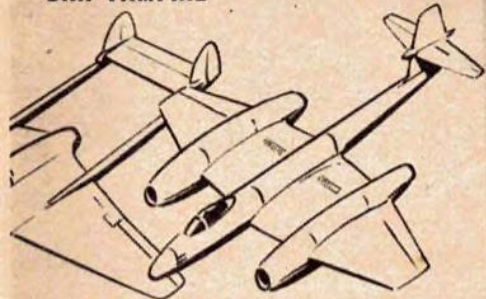


SUPERMARINE  
SEA OTTER



# PACT AIR FORCE & USAF

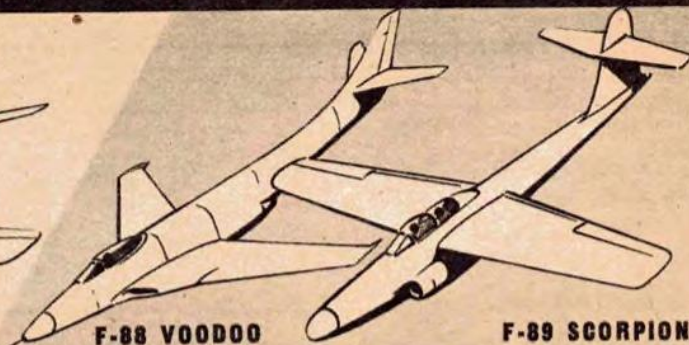
D.H. VAMPIRE



F-86 SABRE



F-88 VOODOO



F-89 SCORPION

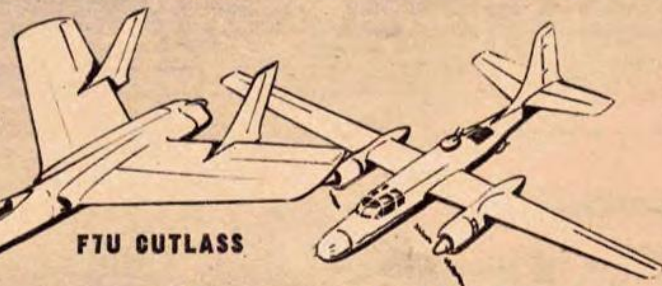
GLOSTER METEOR 8



F-84 THUNDERJET



FTU CUTLASS

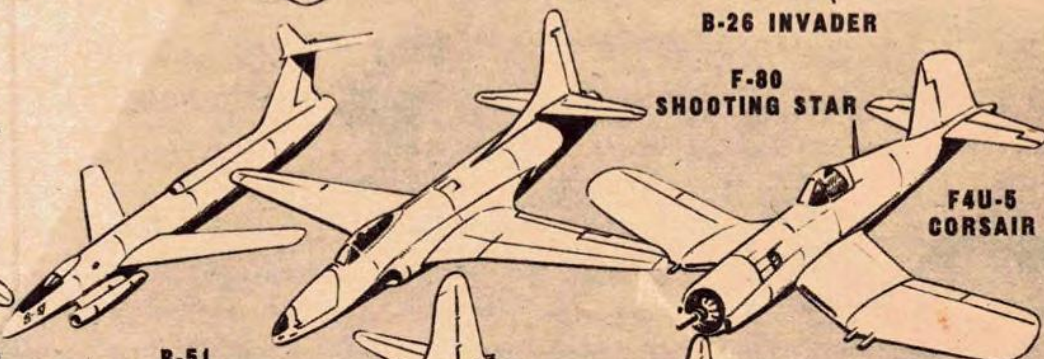


B-26 INVADER

SUPERMARINE  
SEA ATTACKER



F-80  
SHOOTING STAR



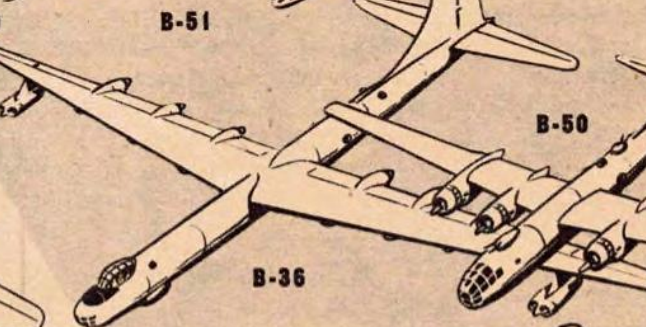
F4U-5  
CORSAIR

FAIREY G.R.17



D.H. MOSQUITO

B-51



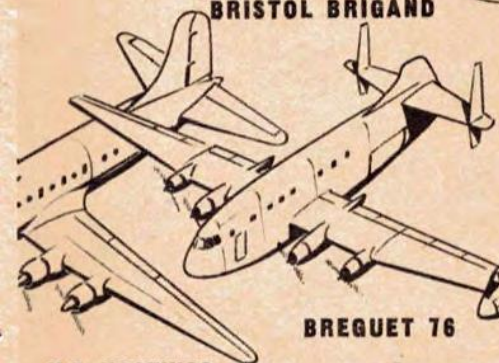
B-50

B-36

B-47  
STRATOJET



BRISTOL BRIGAND



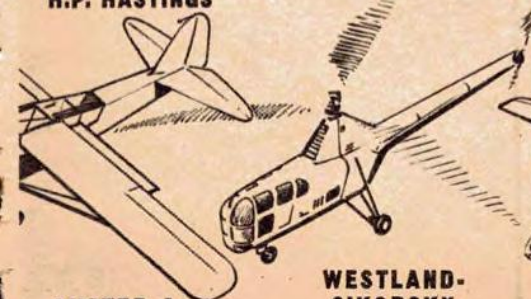
BREGUET 76

C-119 PACKET

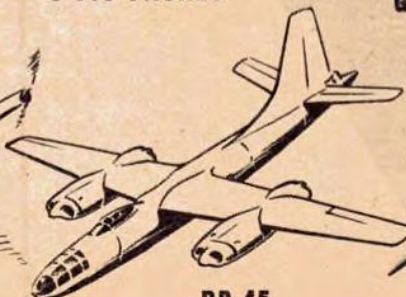
C-124  
GLOBEMASTER

C-97  
STRATOFREIGHTER

H.P. HASTINGS



WESTLAND-  
SIKORSKY



RB-45

CESSNA LC-126A

HUP-1





# MAIN AIRCRAFT TYPES IN SERVICE WITH SOVIET AIR FORCE

## FIGHTERS

| Designation | Engines           | HP                | Max. MPH       | Cruis. MPH | Span  | Length | Armament                 |
|-------------|-------------------|-------------------|----------------|------------|-------|--------|--------------------------|
| Yak-9P      | VK-107A           | 1600              | 370            | 195        | 32'0" | 27'10" | 1 x 20mm<br>2 x 12.7     |
| Yak-3       | VK-107            | 1310              | 402            |            | 31'0" | 29'0"  | 1 x 20mm<br>2 x 12.7     |
| La-9        | ASH-82<br>FNV     | 1850              | 410            | 340        | 30'0" | 35'3"  | 1 x 20mm<br>2 x 12.7     |
| La-11       | ASH-82<br>FNV     | 1850              | 400            | 340        | 28'0" | 32'0"  | 3 x 20mm                 |
|             |                   | <b>Lbs. S. T.</b> |                |            |       |        |                          |
| Yak-15      | M-004B            | 2000<br>plus      | 505            | 370        | 30'0" | 28'0"  | 1 x 20mm<br>2 x 12.7     |
| Yak-15B*    | M-004             | 2000<br>plus      | 505            | 370        | 30'0" | 28'0"  | 2 x 20mm<br>or 30mm      |
| Mig-9       | Two<br>M-003      | 2000<br>plus      | 595            | 450        | 34'0" | 32'9"  | 3 x 20mm<br>1 x 43mm     |
| Yak-17*     | M-003<br>or M-004 | 2000<br>plus      | Approx.<br>550 |            |       |        |                          |
| Yak-19      |                   |                   |                |            |       |        |                          |
| Yak-21*     | HWK<br>509-C      | 4500              | Approx.<br>670 |            | 30'0" | 19'0"  |                          |
| MiG-15      |                   |                   | 640            |            | 33'0" | 33'0"  | 1/2 x 20mm<br>1/2 x 30mm |
| La-17       |                   |                   | 620            |            | 39'6" | 37'0"  | 1 x 20mm<br>1 x 30mm     |

## BOMBERS AND ATTACK AIRCRAFT

|        |                                |              |                |                |        |       |                                   |
|--------|--------------------------------|--------------|----------------|----------------|--------|-------|-----------------------------------|
| Tu-2   | Two<br>ASH-82                  | 1850         | 345            |                | 62'0"  | 46'0" | 2 x 20mm<br>3 x 12.7              |
| Tu-4   | Four<br>M-90                   | 2000<br>plus |                |                | 141'0" | 99'0" |                                   |
| Tu-6   | Two<br>ASH-82                  | 1850         |                |                | 72'0"  | 46'0" |                                   |
| Pe-2   | Two<br>VK-105R                 | 1100         | 322            | 195            | 56'3"  | 41'6" | 4 x 7.62<br>2 x 12.7              |
| IL-10  | Alternative<br>VK-107<br>AM-42 | 1800<br>2000 | 333            |                | 45'0"  | 38'0" | 2 x 30mm<br>1 x 20mm<br>2 x 7.6mm |
| Tu-10* | Two<br>M-012H*                 | 4500*        | Approx.<br>540 | Approx.<br>450 | 65'0"  | 60'0" |                                   |

## TRANSPORT AIRCRAFT

|         |                     |              |     |     |        |        |  |
|---------|---------------------|--------------|-----|-----|--------|--------|--|
| Li-2    | Two<br>M-62R        | 1000         |     |     | 95'0"  | 64'6"  |  |
| IL-12   | Two<br>ASH-82<br>FN | 1775         | 252 | 208 | 104'0" | 70'0"  |  |
| IL-18   | Four<br>ASH-82      | 1775         | 265 | 230 | 131'0" | 99'9"  |  |
| Tu-70   | Four<br>M-90        | 2000<br>plus |     | 207 | 141'0" | 119'0" |  |
| Yak-16  | Two<br>ASH-21       | 690          | 230 | 195 | 65'3"  | 51'0"  |  |
| Shche-2 | Two<br>M-11D        | 145          |     |     | 72'0"  | 52'0"  |  |

## TRAINING AIRCRAFT

|          |        |              |     |     |       |       |  |
|----------|--------|--------------|-----|-----|-------|-------|--|
| Yak-15** | M-004  | 2000<br>plus | 500 | 370 | 30'0" | 28'0" |  |
| UT-2     | M-11   | 110          | 120 |     |       |       |  |
| Yak-18   | M-11RF | 160          |     | 133 |       |       |  |

\* Reported but unconfirmed designation    \*\* Two-seat version

## RUSSIA VS. USAF & ATLANTIC PACT PLANES

On the following two pages is a graphic representation of what Russia could throw in against the anti-communist European air forces which would oppose her in an outright war. Backing up the Atlantic Pact nations is the United States Air Force (shown at far right on page 25). Similar types are shown pitted against one another. Practically all the planes illustrated are operational except for one or two which are expected to be in the air and ready for battle by mid-summer.





# BIG DIRIGIBLES for the Airlift

A commercial airship line would give helium-rich U. S. a fast-moving merchant marine of the air

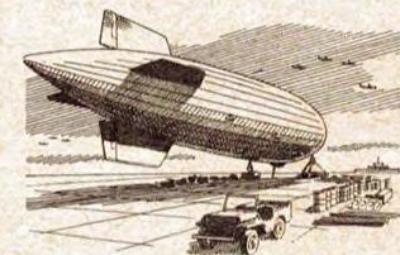
■ With our experience in Korea giving us a second reminder (the Berlin Airlift being the first) of how important the speedy and economical movement of supplies and war material overseas is in emergency, it is my considered judgment that America should take steps immediately toward developing the advantages of rigid airships.

I am not talking about blimps. The smaller airships were useful members of the Navy's "hunter-

**By P. W. LITCHFIELD**

**Chairman of the Board, The Goodyear Tire & Rubber Co., Inc.**

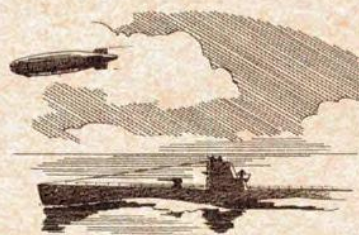
killer" team in the battle against submarines in World War II, became accepted units of our military forces. I am happy to say that a strong



blimp program, using greatly improved ships, is in the making. What I have in mind is the big Zeppelin-type airships to supplement America's airlift as large-capacity, long range and relatively high-speed cargo carriers.

Our national interest in events beyond the Pacific seems certain to continue. The distances are great. Korea proved that huge quantities of military supplies are needed to make our power effective and that delays in delivery are costly in men's lives.

And yet, in the big airships, we have at our disposal, and are not using, a vehicle which can transport large quantities of gasoline and fuel oil for planes and tanks, or vital parts and replacement equipment for our fighting machines overseas, carry much greater loads than the largest cargo planes three or four times as fast as our surface ships, which can land to a portable mooring mast erected wherever there is air cover, and not worry about submarine attack.



That submarine menace, in the case of our merchant marine, is much greater today than ever, because of the development in Germany, late in World War II, of the high-speed, long-range, snorkel-type of submarine. The shipbuilding bases in the Baltic where these were built, fell into Russian hands after the war, along with German experience and technique. It is no secret that Russia has taken full advantage of this situation, has a head start in snorkel procurement over any other country, including America.

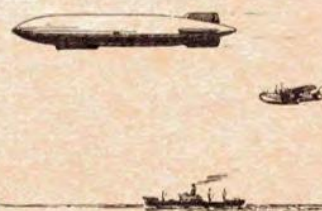
Had the snorkels been available to the enemy in 1941 instead of 1945, we would have found it very difficult (and here I quote a high ranking Naval authority) "to justify transporting an army overseas when we were very uncertain that we would be able to supply our overseas forces."

Supply is vital in modern warfare. Yet we saw vast quantities of war materiel pouring into ports along both seaboards in World War II, of which only a small part could be sent out by transport planes, no matter how badly needed. The rest had to go by slow surface vessels, and at times through sub-infested waters.

Another advantage which the airship has, and one not generally realized, is its great fuel economy. It does not depend

on its engines to keep it in the air, any more than a surface ship does to keep afloat. The airship climbs into the air, and stays there through the buoyance of its lifting gas, helium. The airship uses its engines only to drive it ahead. Consequently it uses only a fraction of the fuel in crossing the Pacific that a fleet of airplanes with equivalent carrying capacity would require. On missions over water where refueling points are far apart, the airplanes might use five times as much fuel to get to their destination and back as the airships.

I do not need to point out the necessity of making the most efficient use possible (Continued on page 71)



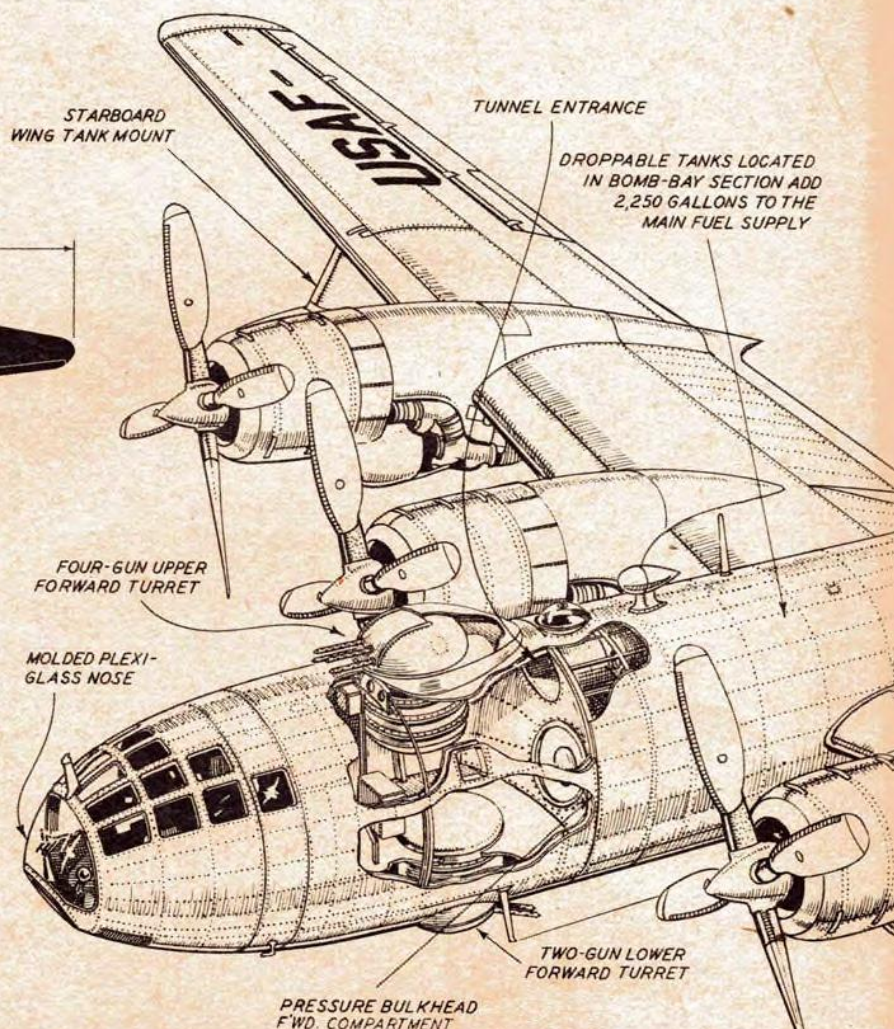
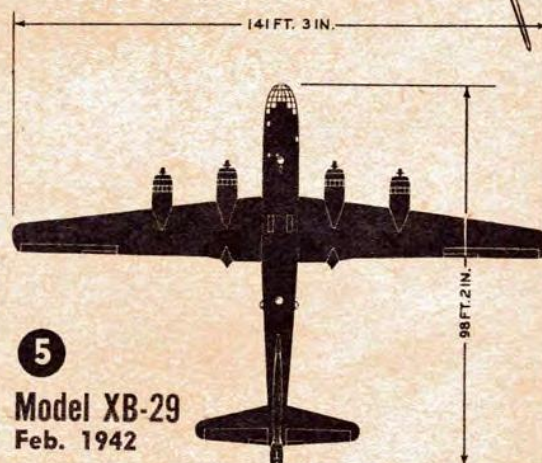
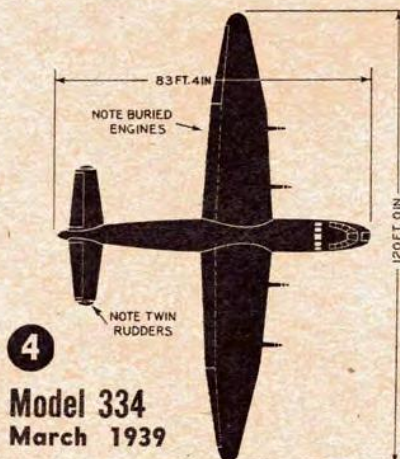
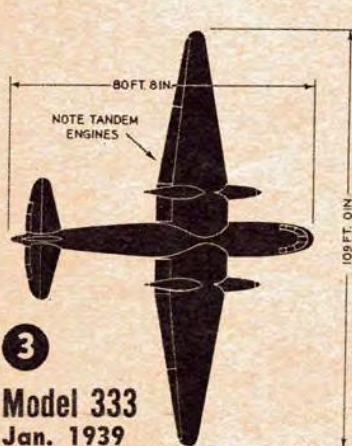
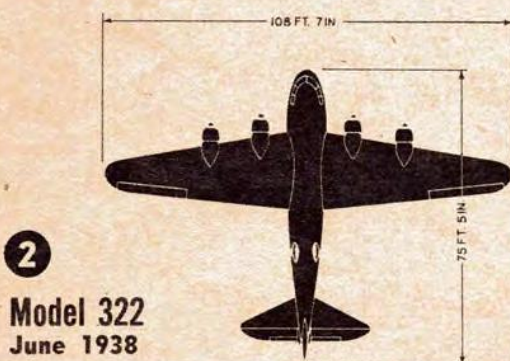
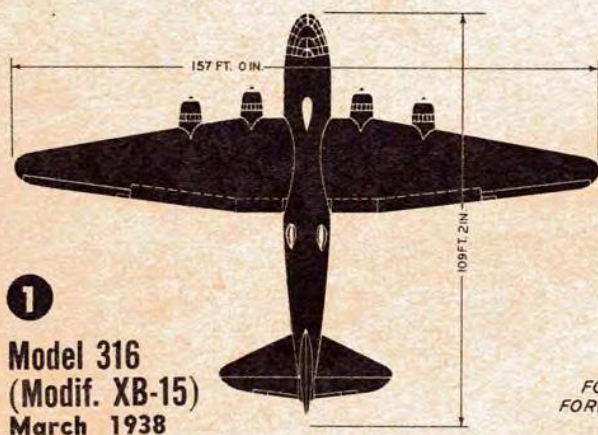


# AIR PROGRESS

By DOUGLAS ROLFE

## EVOLUTION OF THE SUPERFORT

Design growth of B-50D long-range bomber began in '37

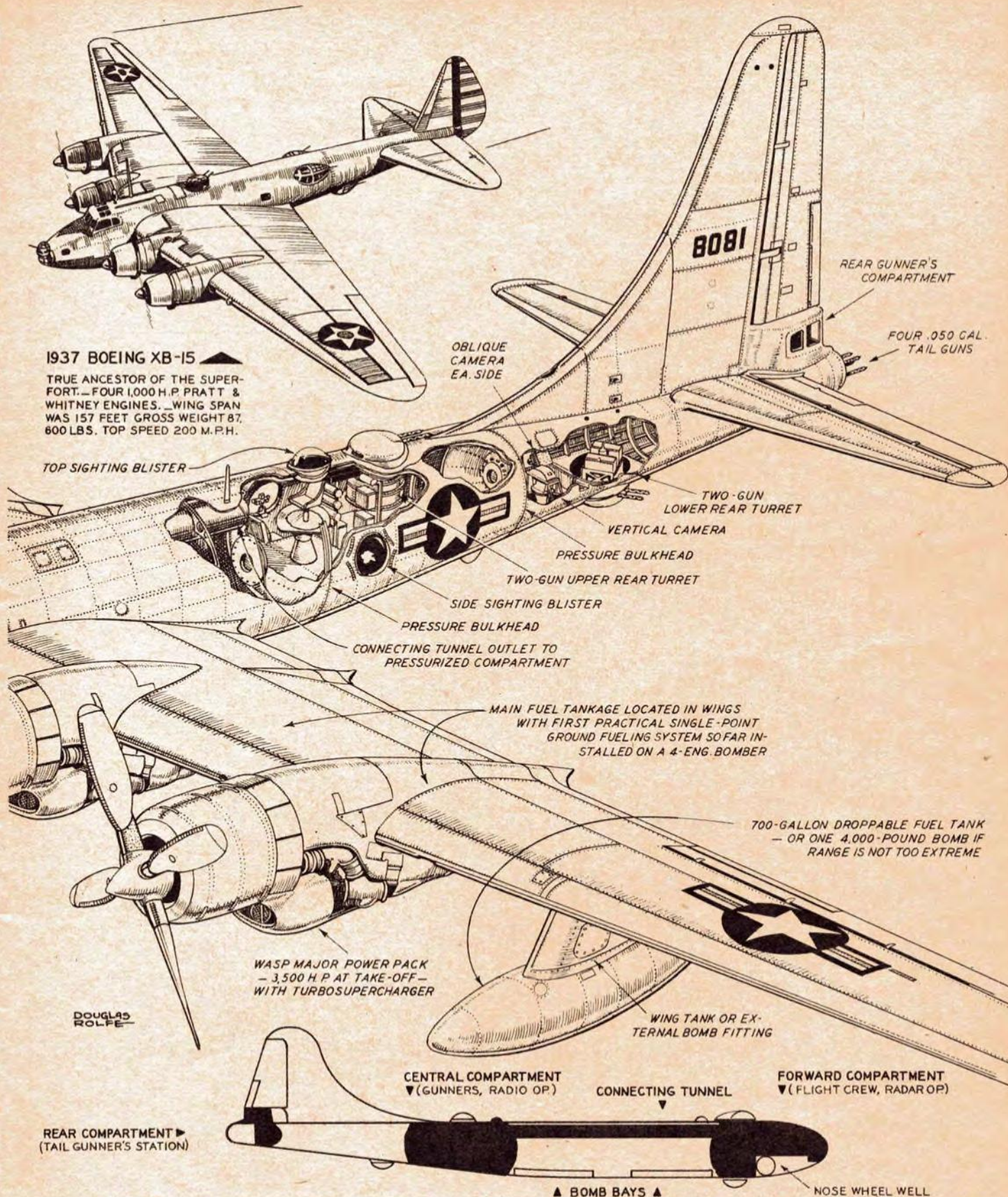


All top-views same scale

First approach to the Superfort was the XB-15, sadly underpowered—the engines intended not being available. Model 316, which followed, was high-wing version of XB-15 and designed to use four 2,000 hp radials. Next project, Model 322, was modified version of B-17 with pressurized fuselage

and tricycle landing gear. Models 333 and 334 were designed around the 1,150 hp Allison in-line engine—the former with four engines in tandem pairs, two pushers, two tractors; the latter with four engines partially buried in wings. Boeing's first use of such powerplants resulted in failure.





## PRESSURIZED SECTIONS OF THE B-50

Model 334A (not shown) laid out in '39 was initial approach to present Superfort configuration and was gradually developed into XB-29—prototype model of famed B-29. Last production model of B-29A was delivered in spring of '46. Consequently developed B-29D was prototype of present

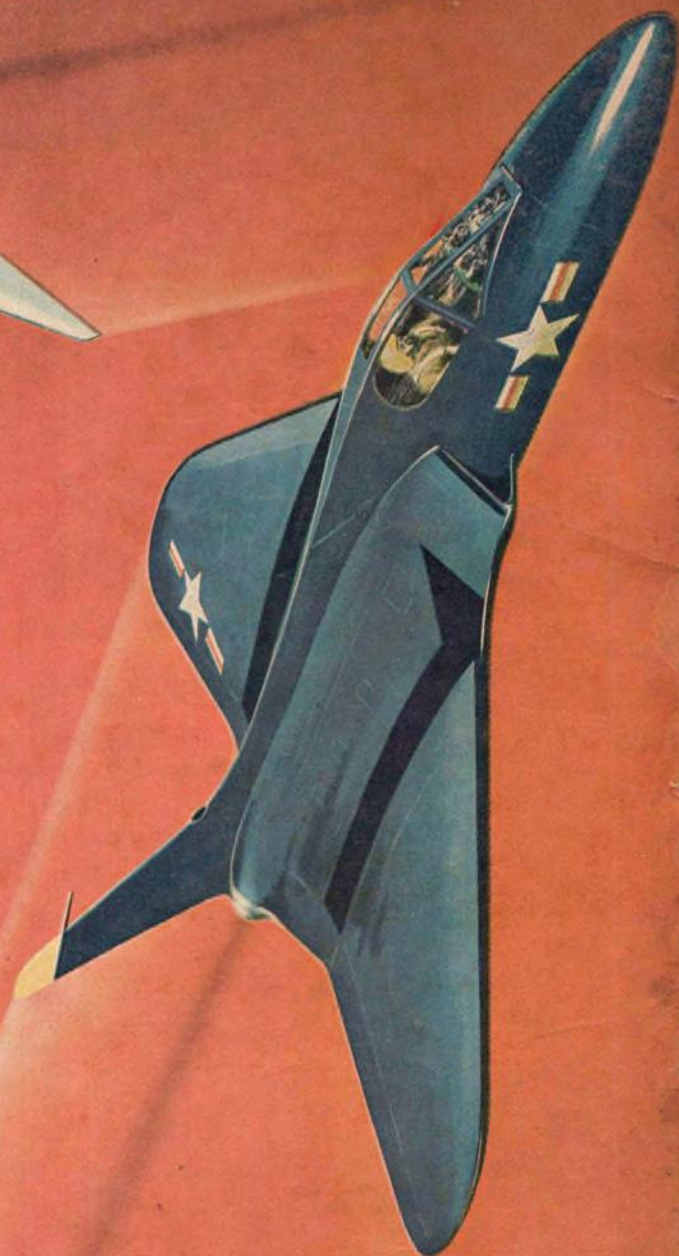
B-50. (Note: Main cutaway drawing does not pretend to be technically accurate structurally, but does portray with as much accuracy as security regulations allow the main features of the design including disposition of fire-power, etc. Silhouettes show widely different design approaches made.)



JUNE 1951 • 25 CENTS

# AIR TRAILS

MAY 2 N D



## SPACE MEN—

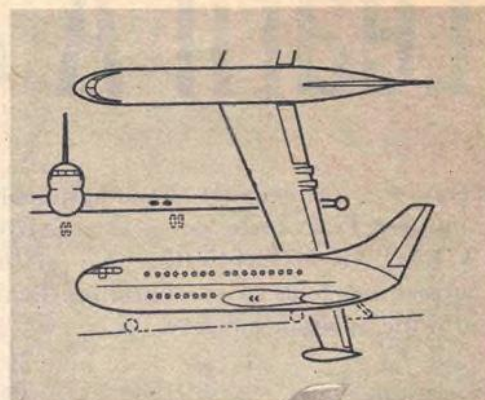
The Navy's Most Dangerous Job  
**BUILD "THE WORLD'S  
SMALLEST AIRPLANE"!**



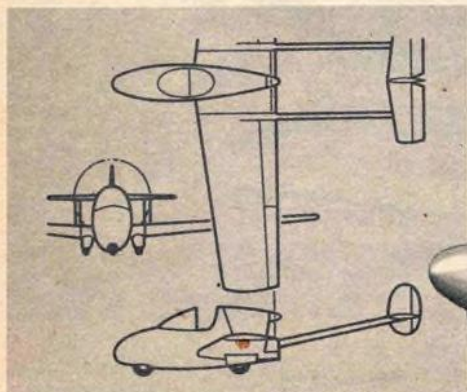
# Airmen of Vision

## DESIGN COMPETITION

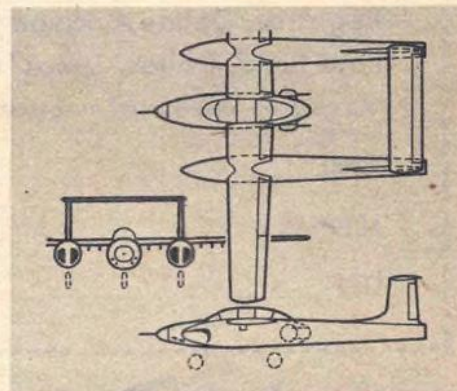
Selected as the outstanding design of this month is the "America," a 60-passenger jet transport by Philip Pauley of So. Plainfield, N. J. Interesting feature of plane is absence of horizontal tail to reduce drag. Balance is achieved by locating the swept-back wing well rearward. Plane has porous bronze wing surface to increase wing efficiency. Span 152 ft., cruising speed 550 mph.



The Fly-Scooter, combination airplane and motor scooter by aeronautical engineer A. F. Vinje of Santa Monica, Calif. Powered by a 65 hp engine restricted to 20 hp when used on road. Maximum speed as plane is 140 mph, as scooter 50 mph. Wing and tail unit is removed by actuating three levers.



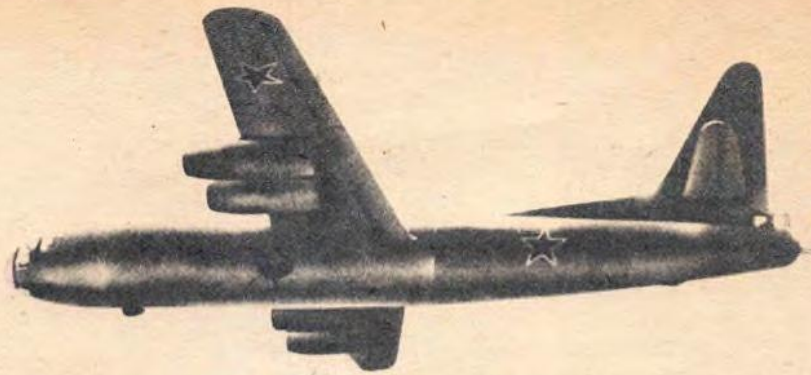
Attack and ground support jet plane by John J. Davye of Miami, Fla. Carries crew of three with pilot and co-pilot side-by-side and gunner behind handling four cal. .50 mg's paired in two side turrets. Forward armament consists of a .50 cal. mg in nose with provision for four 20-mm cannons on side fired by pilot. Wingspan is 80 ft.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type, commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





# Russia — Colossus of the Air

## PART II

By "ARGUS"

**Why are the Soviets suddenly placing so much stress on Naval Aviation? Is the Soviet Air Force losing ground to the carrier-battleship crowd?**

■ Visualize an aerial armada of between 15,000 and 20,000 airplanes backed up by the greatest state-sponsored research and productive effort known to man and you have the Soviet Air Force and Russia's accelerated aviation program.

In a preceding article we examined the technical development of the Russians, the schools that produce the engineers and some of the accomplishments of the USSR in the fields of airborne weapons, powerplants and communication. Now let us consider the basic organization and functions of the Soviet Air Force and Naval aviation.

All Soviet military air forces, with the exception of the Naval Air Arm, are administered in the first place from the War Ministry under Marshal Vassilevski. Closer control is exercised by the Commander-in-Chief of the Soviet Air Force, Colonel-General Zhigarev, who co-ordinates the activities of the two main air force commands in the East and in the West, Russian air strength being split between the Western and Eastern "spheres of influence," both of which are fully backed by separate production and raw material resources.

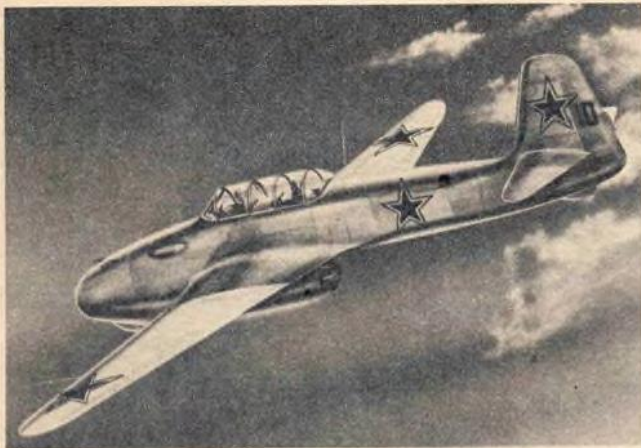
Further sub-divisions are the Military District Air Armies, which break down into Fighter Defense, Army Co-operation, and Heavy Air Corps. These Corps consist of a number of Air Regiments which, in the case of a Fighter Regiment equipped with piston-engined aircraft, include four squadrons each having three flights of four aircraft. Regiment and squadron strength for jet fighters, bombers and other types probably differ in detail, but their basic structure remains the same.

From the top direction downwards, the air forces function primarily as an auxiliary of the all-important Red Army. The recent reduction in appropriations (by 800,000,000 roubles) for the Soviet Army, on which depends the Air Force, and the transference of this amount to the Naval Air Arm in order that the latter could take over all strategic bombing units, together with certain bomber bases, from the S.A.F., indicate that this policy is being followed tenaciously and, perhaps, correctly, in view of the highly efficient way in which the Soviet advance was assisted by tactical air support during the latter half of World War II.

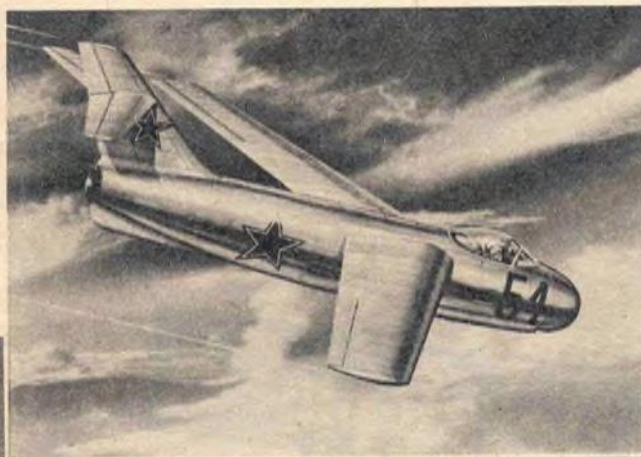
This inter-relationship between the Soviet Army and Air Force, although well known, has tended to be overshadowed recently by the threat of Russian atomic weapons carried by a strong strategic bombing force, an opinion fostered by the appearance of large quantities of the Tupolev Tu-4 (Russian production version of the Boeing B-29). However, the transference of these aircraft to Naval units strengthens our opinion that the real danger from the Soviet Air Force is, and will remain, its ability to bludgeon a way ahead of Red ground formations. The S.A.F. is, in fact, a tactical Air Force in the true sense, and Atlantic Pact air rearmament should be conducted primarily to neutralize this close support role and to give stronger backing to our own feeble ground forces.

Hitherto, Naval Aviation has formed only a minor part of the total Soviet air strength, and during the war only a small proportion of the Naval aircraft were operating over the sea. All but a few squadrons





Above: Russia's first two-seater jet trainer. Derived from the Yak-15, it differs from it only in having a second cockpit added for the trainee. Below: A later fighter than the MiG-15 is the Lavochkin La-17; somewhat larger and heavier, it has a shoulder mounted wing with approximately 30° sweepback. The maximum speed is around 630 mph. Opposite page: Four-jet medium bomber believed to be designated Il-16, designed by Serge Ilyushin. Engines are suspended on streamlined pylons as in case of our B-47.



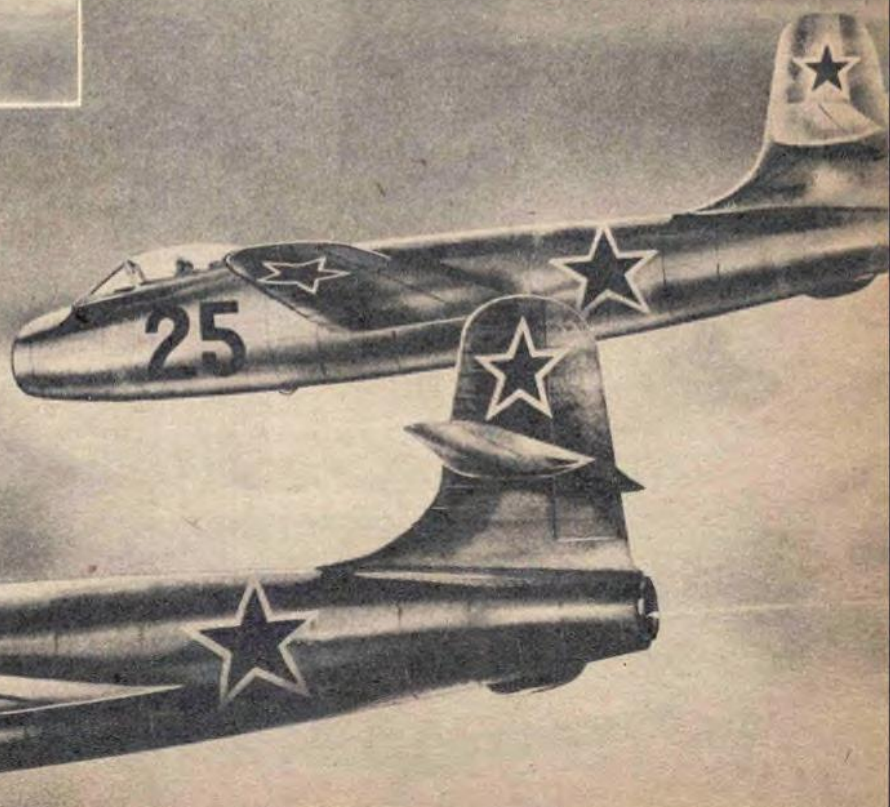
were land-based, the Russians not then possessing any aircraft carriers, and they were organized under separate Commands attached respectively to the Black Sea, White Sea, Baltic and Far Eastern Fleets, and the Caspian Flotilla. Except for the flying-boat units, equipped for the most part with Catalinas, aircraft were the same as those used by the bulk of the Soviet Air Force.

Early last year naval affairs in the Soviet Union took a new turn when a Navy Ministry, separate from the War Ministry, was formed under Admiral I. S. Yumashev as Navy Minister. This change confirmed recurring reports that the Soviet Navy is taking on a new lease of life. A big, modernized submarine fleet, already consisting of 350-400 underwater craft of varying sizes is being formed and new construction of capital ships is under way, the first units of which have already been delivered.

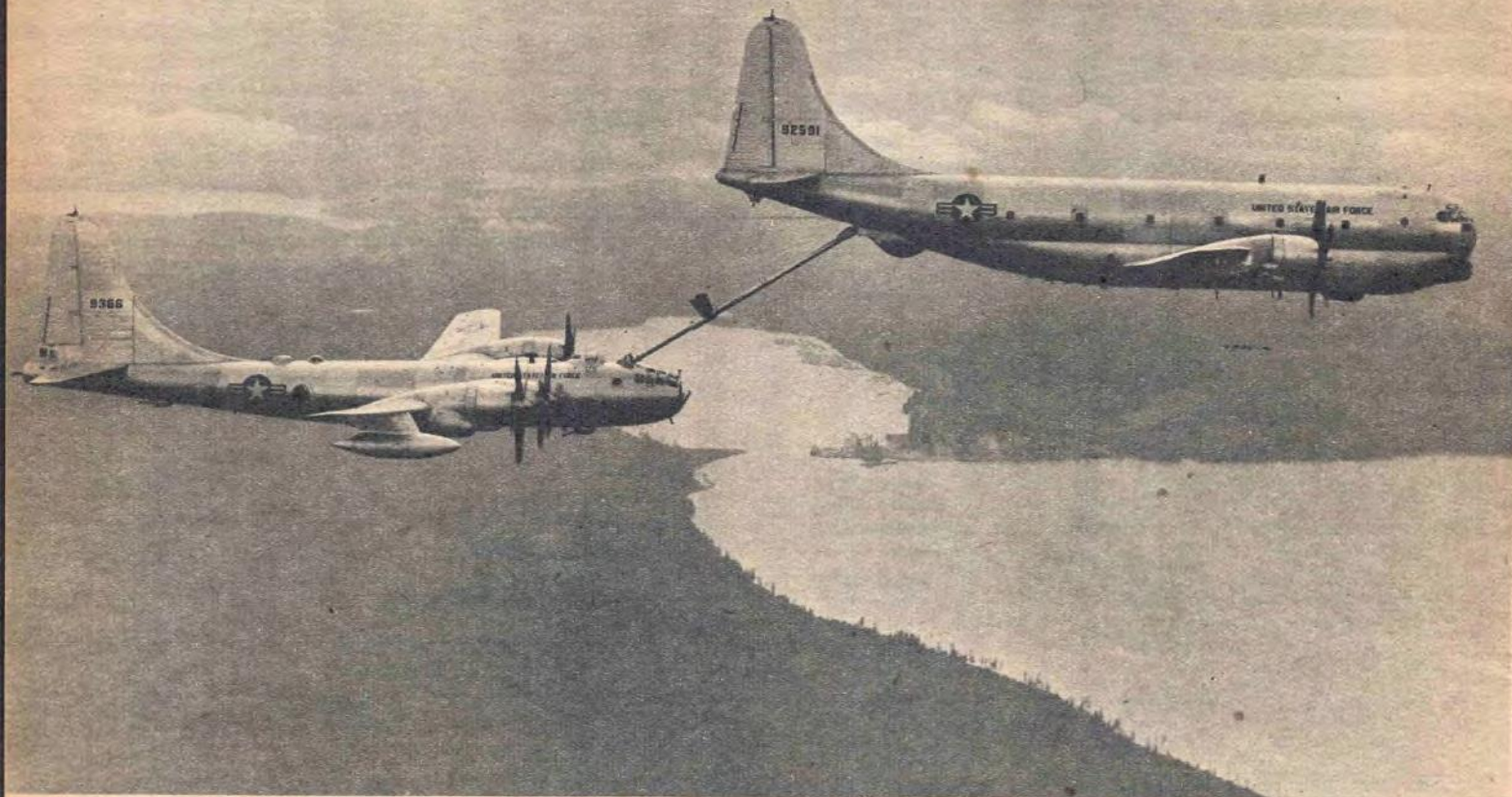
These new battleships are known as the *Sojus* (Union) Class, and those completed include the *Sojus*, the *Sovietski*, the *Strana Sovietov* and the *Belo Russia*. All these capital ships are, at the present time, based in Arctic waters—they have not risked observation by passing through the Baltic narrows—and reports indicate that they are fitted for firing long-range rockets of the V-2 type.

Naval aviation is certainly playing an important part in this expansion, and the first of three large aircraft carriers (of 20, 23, and 25,000 tons) is known to have been completed recently. The types of aircraft to be carried by these (Continued on page 69)

Dubbed the Russian Thunderjet because of its resemblance to the Republic F-84 (tho smaller), this sleek fighter is designated Yak-17.







A Boeing KC-97A Stratofreighter in its new role as an aerial tanker refueling a B-50D bomber. This latest addition to its duties increases

the versatility of the large double-deck airplane that can also be put in service as a hospital plane or as a heavy duty freighter.



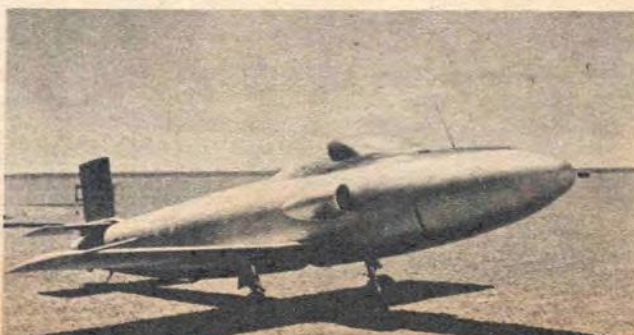
Newest version of Il-12, a Russian airliner, carries 27-32 passengers. Extensively used by Soviet Aeroflot airline as well by Czech C.S.A. and Polish L.O.T. carriers. The span is 104 ft. Speed 200 mph.

## Development Highlights

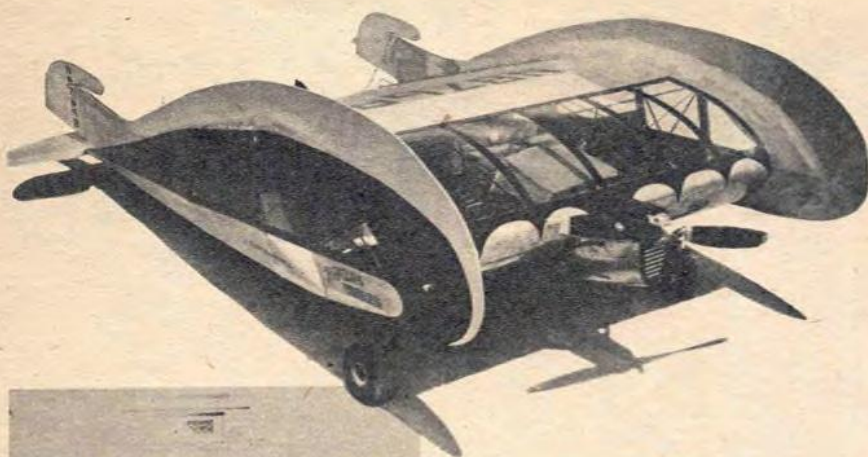
Research farm plane for crop dusting and spraying designed and built at Texas A & M University under direction of Fred Weick of Ercoupe fame. 225 hp Continental, high-lift wing, lands at 37 mph.



Project "C". Australia's first jet plane, built by Government Aircraft Factory: high-speed target drone powered by 1100 lb. thrust engine. Span 19 ft. Craft is controlled from ground or air by radio.





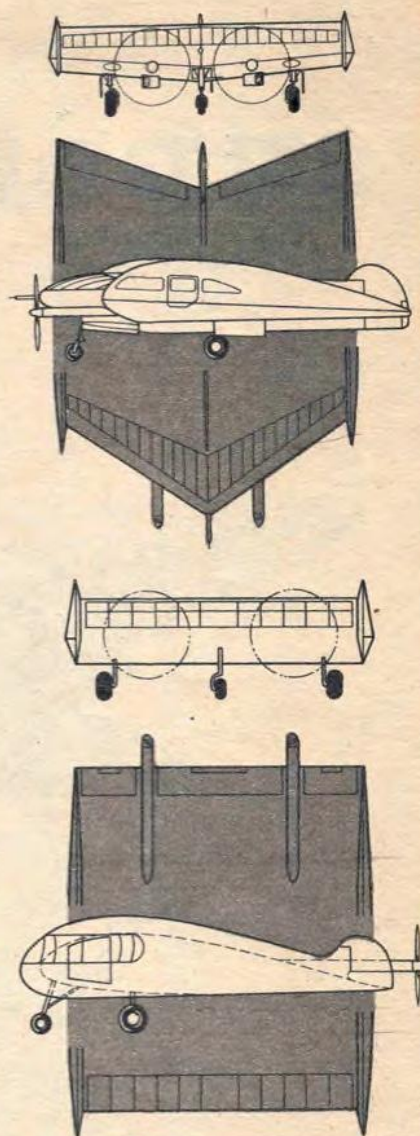


Horton prototype and proposed Flying auto. The three-views show variations on theme.

## Horton Wingless Plane

■ You would not think that it could fly, but actually the wingless craft above got off the ground during fast taxiing test in Florida. Designed and built by William E. Horton, aircraft and automotive engineer, this prototype is 12 ft. wide and 22½ ft. long. Horton claims that flight is made possible by "sealing velocity pressure" by means of large wingtip plates. These, he says, considerably

reduce tip vortex and effectively control boundary layer of the narrow-span wing, giving it a high lift factor. Other advantages claimed for the design are simple construction and easy adaptability as a "roadable." The original got off the ground and attained an altitude of 10 ft. at Winter Haven, Fla., but extreme control sensitivity convinced Horton more work was needed. On a subsequent test the strange craft was damaged when a tire blew during high-speed taxiing. Horton is now on the West Coast and an engineer with North American Aviation. In his spare time he is designing a twin-engine wingless plane. Construction is to be supervised by an associate, Wallace Johnson. Horton estimates that the new design will have a speed of 200 mph, carry 12 passengers. He envisions a 4-place Wingless Flying Auto and a fighter-bomber.

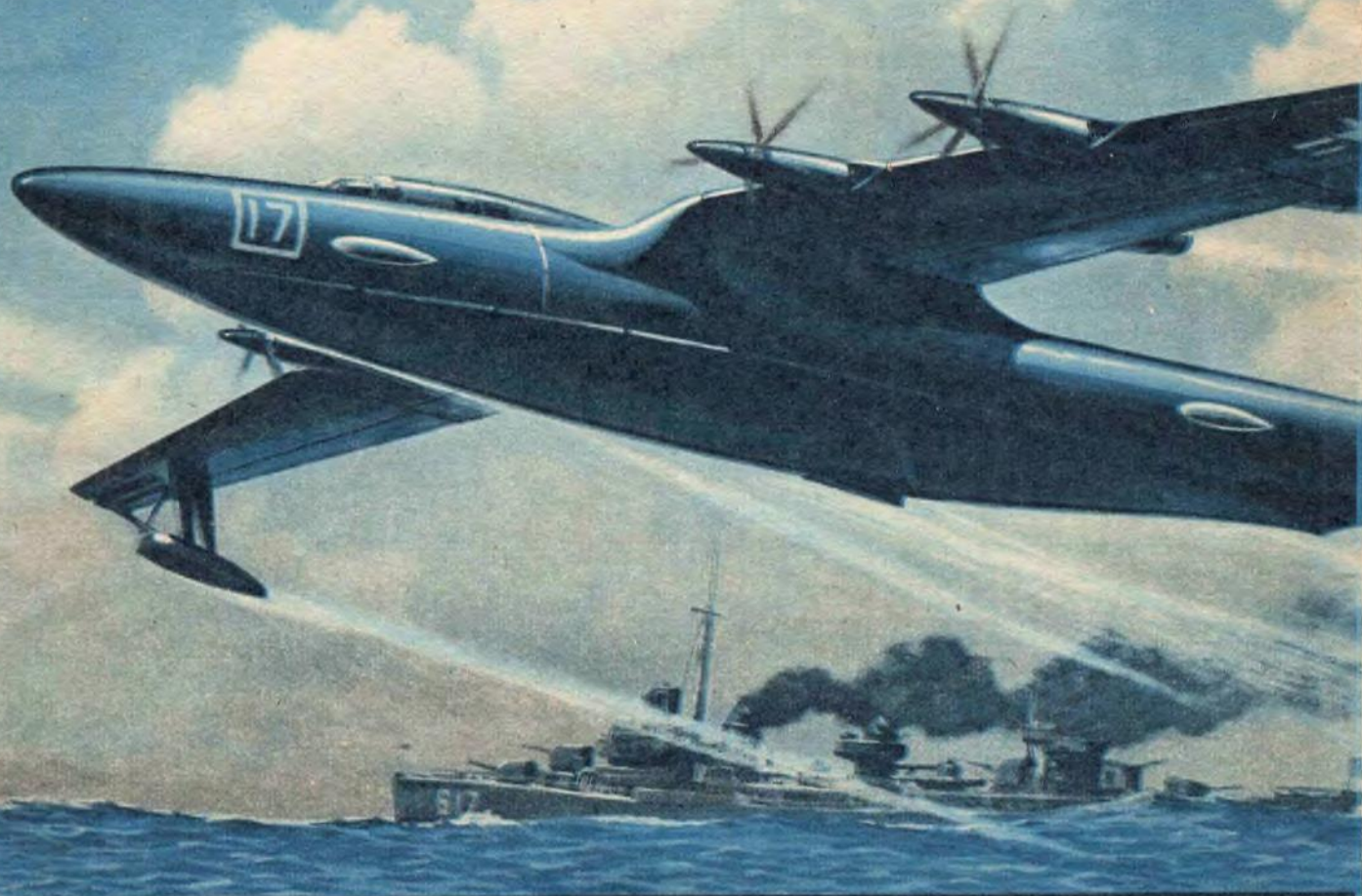


Hiller "Hornet" twin ram-jet helicopter (right) which is expected to sell for less than \$5,000. Available with enclosed cabin or as an open utility model as shown. Rotor blades fold allowing storage in average garage. Use of ram jet eliminates torque and makes structure extremely simple. Copter has only two controls, no pedals. Below: English Electric Canberra which spanned the ocean in 4 hrs. 40 min. puts on low-flying demonstration at Glenn L. Martin plant, Baltimore, Md. Pilot was Wing Commander Roland Beamont of RAF.





# supersonic flying

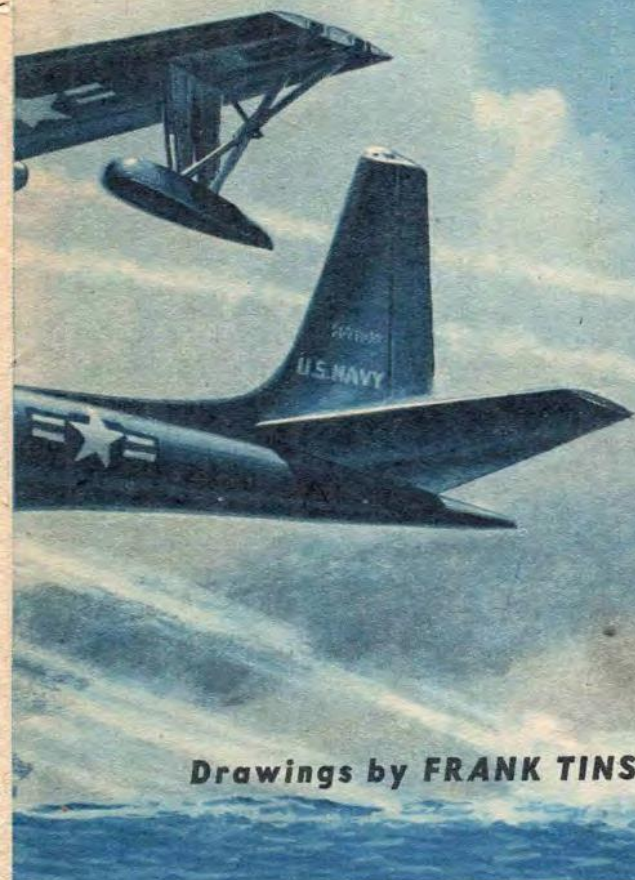


■ For many years the flying boat was a designer's orphan constantly losing the race for speed and utility with the landplane until it looked as though it was about to be shelved for all time. In a world where transonic and supersonic speeds were becoming a foregone conclusion, the flying boat plodded along well below 200 mph. While landplanes' shapes were carefully nursed into a supersonic and drag-reducing slimness, the seaplane was still being designed as a marine boat that flew, instead of an airplane which used water surfaces for take-off and landing. The hull was large and bulky because the aircraft was primarily designed for long range, large load capacity and seaworthiness, and the general configuration followed boat practices. Consequently, drag on the water and in the air was high and many of the planes had bad water porpoising char-

acteristics on take-off, especially if the length-to-beam ratio of the hull was low. It was obvious, that in order to obtain speed, the hull, which had the same function as the fuselage, required streamlining. The landplane arrives at its slimness through the use of a landing gear, while the seaplane's alighting gear is its belly; thus the difference in bulk between the two types of aircraft. Nevertheless, N.A.C.A., Consolidated-Vultee and Martin started experimenting with slimmer hulls, gradually increasing the fineness ratio (length-to-beam) and found that it not only improved the flying boat's aerodynamic efficiency but also made it more stable on water and even improved its take-off characteristics. At the same time, the entire plane was cleaned up by streamlining engine installation, doing away with different protuberances, and a general slicking up.

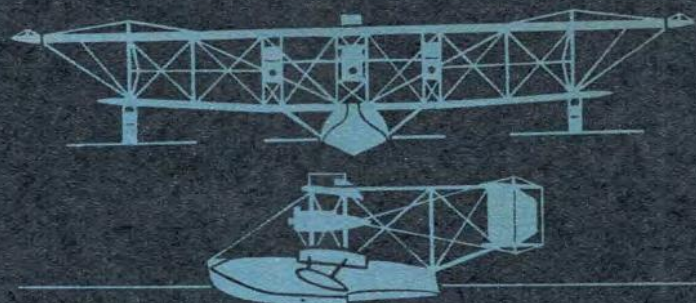


# boats



Drawings by FRANK TINSLEY

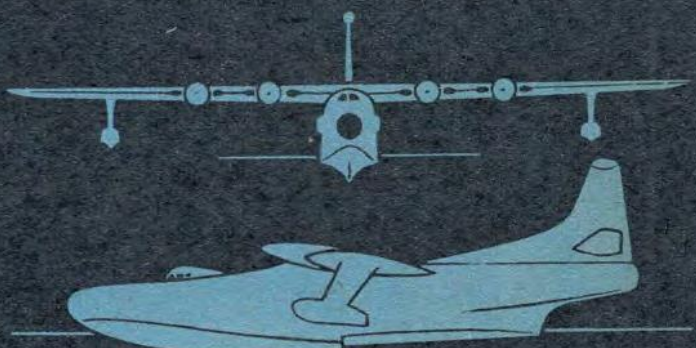
As a result of these findings Convair launched the design of a really fast flying boat powered by turbo-prop engines, which fortunately became a reality just in time. Known as the XP5Y-1 or R3Y-1, it proved the point by unofficially establishing a speed record for flying boats, in the vicinity of 400 mph. What is the next step? Obviously, from the designer's standpoint, the supersonic flying boat. It may not come today or tomorrow, but in the light of what the hull boys know now, it is entirely feasible. Already Convair, sponsored by the Navy, is working on Project Skate, which may become the first supersonic flying boat. It undoubtedly will be powered with jet or turbo-prop engines, will have a long slim hull with a fineness ratio of at least ten, and swept-back thin wing, giving new lease on life to the flying boat type.



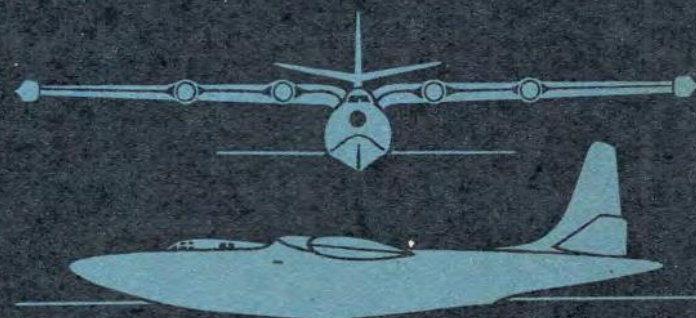
NC-4, 1918. This famous transoceanic flying boat was a nightmare from the standpoint of drag, by today's thinking. However, its hull offered less resistance to air than the wings, struts, wires and engines, and represented, basically, the formula which today's designers are striving for. Hull length was 45 ft., the ship's beam 10 ft.



MARTIN MARS, 1942. Twenty-four years later with advent of full-cantilever wings and streamlined engine nacelles, designers were forced to concentrate on the problem of hull drag reduction as long range and large payloads swelled the hull size. Increased length-to-beam ratio began to show results here. This is earlier version of Mars.

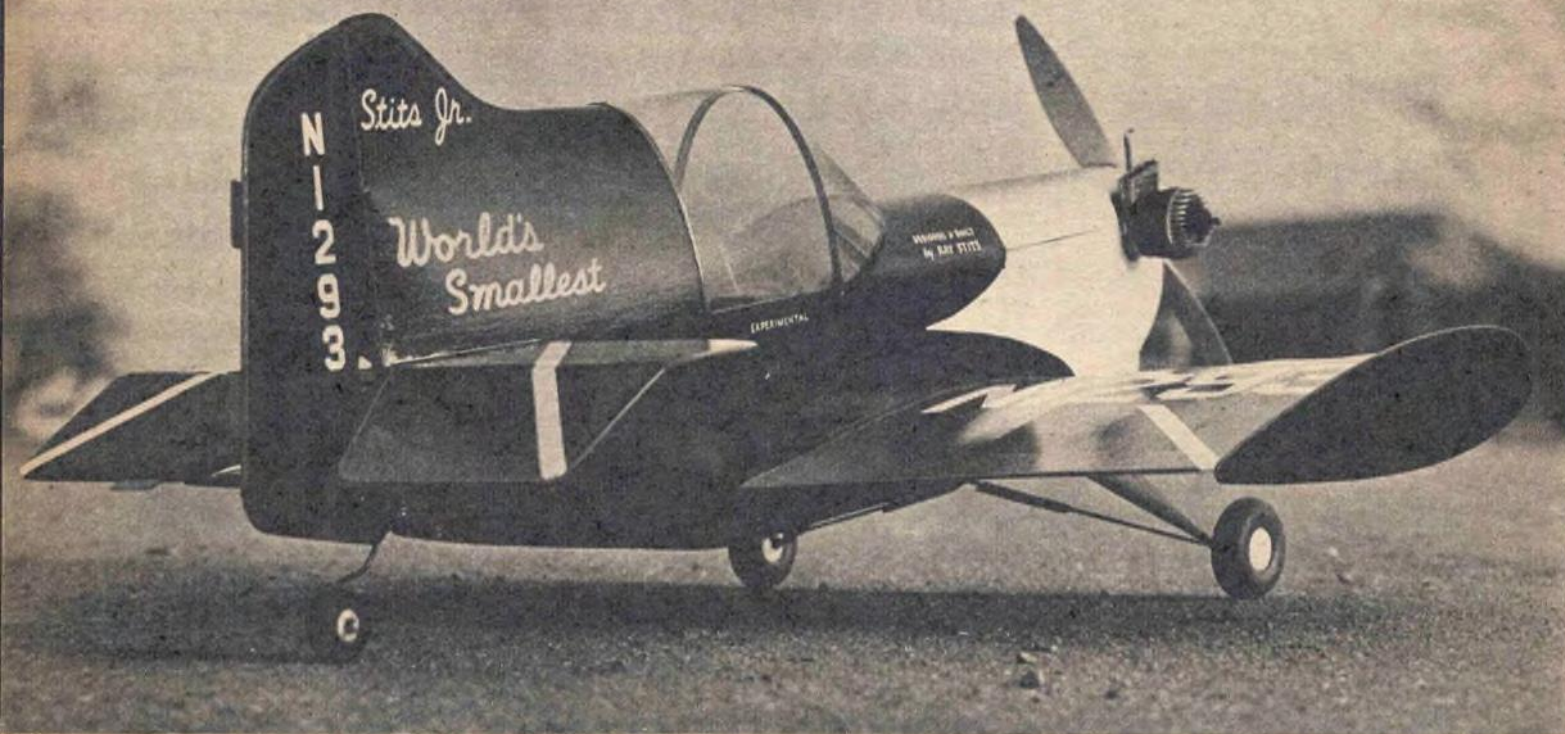


CONVAIR R3Y-1, 1950. Latest fashion in flying boat design. Here, further streamlining was achieved by using partially submerged turbo-prop powerplants. The hull is 100 ft. long and has a 10 ft. beam giving the aircraft a "fineness" ratio of ten. A smaller ship, the XP5M-1 by Glenn L. Martin, is also being used to study hull design problems.



PROJECT SKATE. A preview of what the future holds for the flying boat. Still in design stage at Convair, though models have undergone water towing tests and in near future a dynamically similar radio-controlled model will be tested in flight. Convair firmly believes that a supersonic flying boat is feasible. The Skate may prove it.





A real "George" airplane; wingtip plates were first used by modelers, then picked up by full-scale designers. They increase efficiency by 15%.

By AUBREY KOCHMAN



*World's  
Smallest  
Airplane...*

# Stits Jr.



■ Building a model at two-inches-to-the-foot scale usually results in a large-size craft even if a small plane is used as the prototype. In the case of the *Stits Jr.*, however, we find the opposite to be true because this ship holds claim to "World's Smallest."

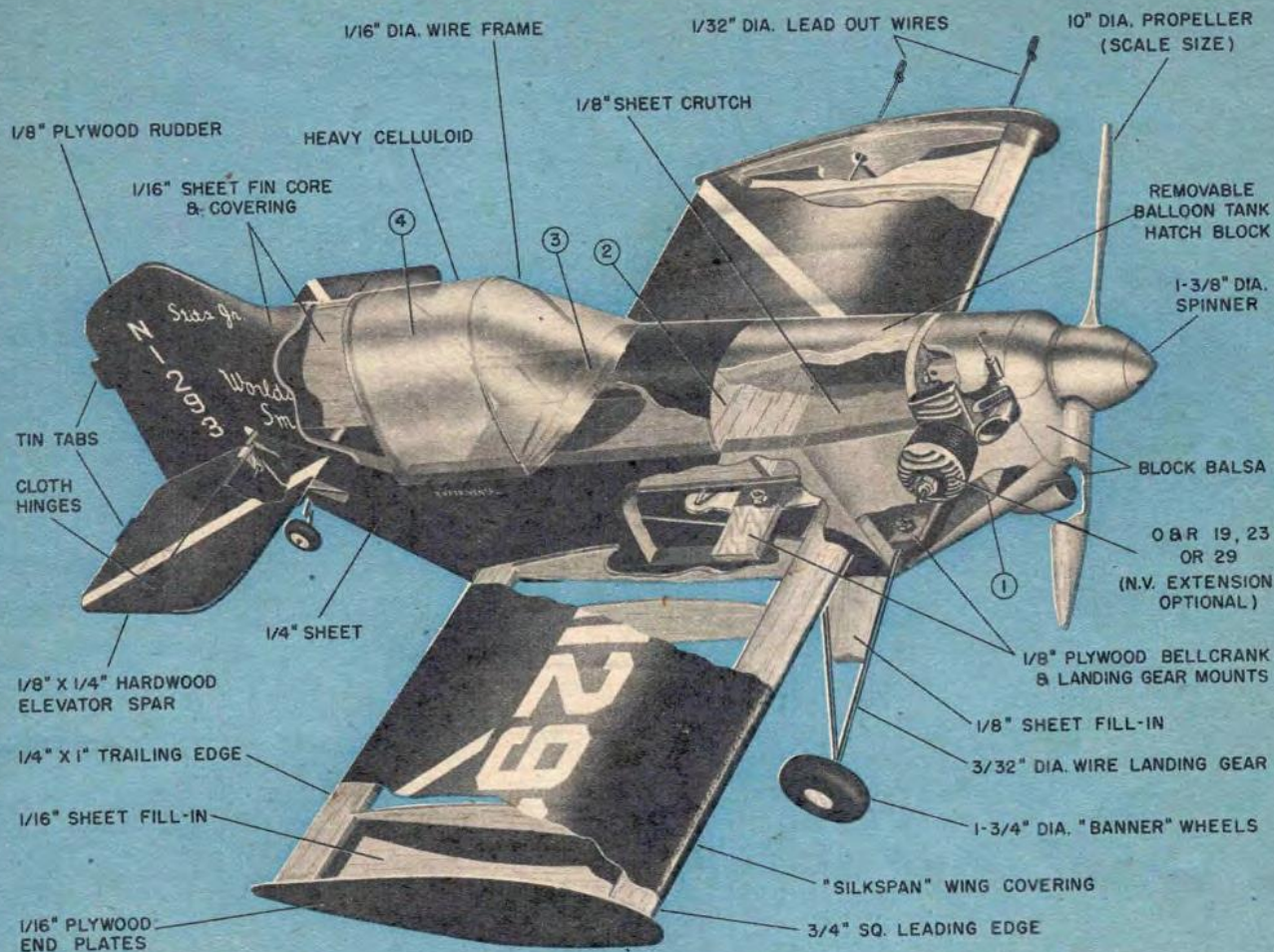
The configuration of the *Stits Jr.* lends itself very well to control line flying with its short tail moment and large tail surfaces. It is not recommended for advanced stunting, however, due to its short span and high wing loading.

Before starting construction bear in mind the all-important weight factor. Following the grade of wood indicated on the plans and depending on the engine used, the finished model should weigh no more than 18 ounces. The model also had a tendency towards nose heaviness, but this was corrected by using a  $\frac{1}{8}$ " plywood rudder.

Build the wing in one piece, crack the leading and trailing edges at the center for the proper dihedral angle and cement the  $\frac{1}{16}$ " plywood gussets in place at the breaks. Add the bellcrank and the lead-out wires but not the end plates. These go on after the wing is covered but before water-shrinking the paper.

The fuselage is built directly onto the wing. Using soft  $\frac{1}{4}$ " sheet, cut two identical pieces 8- $\frac{5}{8}$ " long by





Fuel tank for the craft is a 10¢ toy balloon, first popularized by Jim Walker. Model will take variety of powerplants in the .19 to .29 range.

3" wide. Cut  $\frac{5}{8}$ " off the bottom edge. These pieces are then cut out to fit the leading and trailing edges, the bellcrank mount and the clearance holes for the lead-out wires. Draw a line on the inside of each side at the crutch line and cement these pieces to the inside of the center ribs and perfectly square with each other. Use plenty of cement at all joints.

Cut out the crutch from  $\frac{1}{8}$ " hard sheet as shown on the top and side views and cement in place on the pencil lines previously drawn. Recheck for squareness and alignment. Add the front and rear side pieces working upside down, using the work table to insure a straight top edge. The stabilizer and elevators when completed are cemented to the fuselage so that the stabilizer is flush with the top edge of the sides.

Cut out all formers with the grain running as indicated and cement in place. The fin core is  $\frac{1}{16}$ " hard sheet joined with grain. Cut to outline shape and cement to the stabilizer and former 4. To cover this section, join two pieces of 3" soft sheet and cut to the fin outline shape, allowing a good half inch extra height. It is not necessary to pre-bend this covering. Just run a bead of cement along the top edge of the fuselage sides and the edge of the fin

to which the rudder is joined. Pin the sheeting in place and allow to dry thoroughly.

Now run a bead of cement along the edge of former 4, the fin core and coat the side of the core with cement for about an inch down from the top edge. Work as quickly as possible and pin the sheeting in place starting at the fin-rudder edge and working forward to former 4. Check to make sure that the core remains square with the stabilizer. Follow the same procedure in covering the other side. Trim away excess wood to proper fin outline and smooth any imperfections with filler.

Sheet cover the section between formers 2 and 3, pre-bending the  $\frac{1}{16}$ " sheet by the water and cement method. Install the pushrod, landing gear and tail wheel. Note that the plywood landing gear mount is installed at a slight angle and is cemented to the wing leading edge as well as the fuselage sides. Cover the bottom of the fuselage with  $\frac{1}{8}$ " sheet with the grain running (Continued on page 68)





JULY 1951 • 25 CENTS

# AIR TRAILS



S. CALHOUN SMITH

## SUPERSONIC KILLERS!

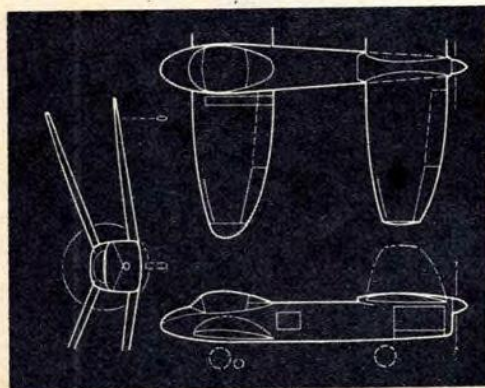
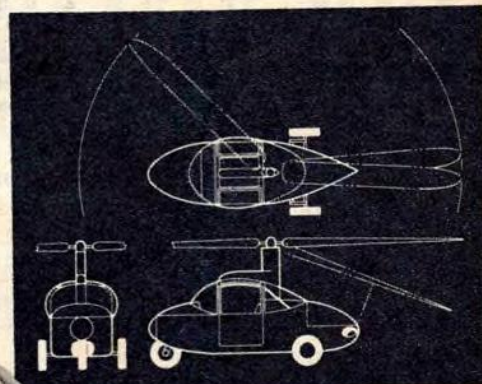
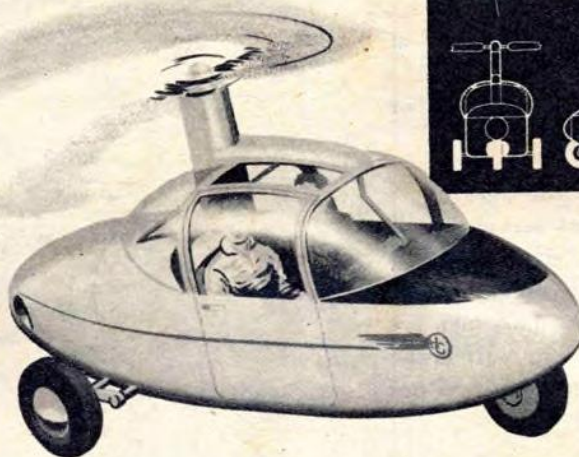
*New breed of fighters  
form first line of defense*



# Airmen of Vision

## DESIGN COMPETITION

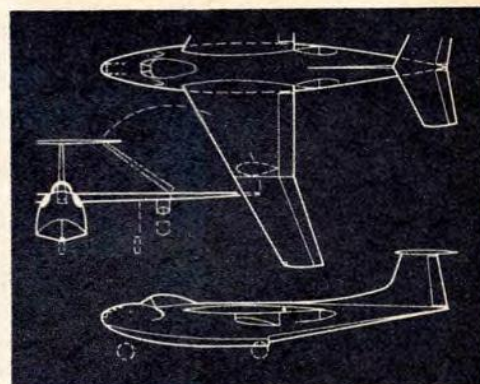
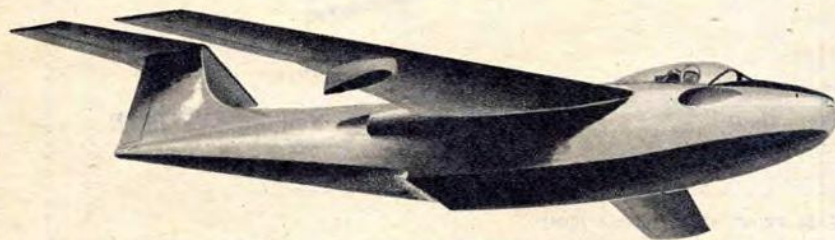
Best design of the month is this roadable, turbo-jet powered helicopter by Douglas Kimura of Chicago, Ill. The 150 hp turbine drives both rotor and wheels. Bifurcated exhaust pipe in rear has deflector vane for controlling rotor torque effect for straight flight and maneuvering. For road use blades fold and are secured to fuselage by retracting strut. Diameter of each blade is 22 feet.



Tandem monoplane by Michael J. Buck of Farnborough, England. Both wings contribute equally to lift, considerably reducing parasite drag; location of engine and propeller increases wing efficiency. Plane has excellent visibility. Powered by 180 hp direct-injection engine. Span 24 ft. Cruising speed 150 mph.



A single-place jet amphibian fighter by Larry R. Kronquest of Los Angeles, Calif. Can operate from carriers, is powered by two 5000 lb. thrust engines. Span 39 ft. Top speed over 600 mph, range 2000 miles. Armament consists of six forward-mounted .50 cal. machine guns, and eight rockets. Wings fold.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



Russia—





# Colossus of the Air

## PART III

■ The first of Russia's swept-wing interceptor fighters, the MiG-15, which has appeared over Korea in some numbers flown by Sino-Communist Air Force pilots, has been the subject of a spate of sensational articles in the less technical sections of the world's Press. Flying across the Yalu River from their base at Autung airfield, just inside Manchuria, these MiG-15s have been enthusiastically credited with 700 mph top speeds. But, exaggeration and sensationalism apart, the MiG-15, which is receiving its operational shake-down in Korea in much

By "ARGUS"

"At dawn the fog cleared and there, near enough to be touched were one hundred and fifty to one hundred and eighty Soviet jet fighters of the MiG-15 type. I photographed some. Later I tried to take them during take-off but it was impossible. They left the ground and climbed at an angle of 45 degrees.

"At the end of the airfield a goods train rolled in laden with huge yellow cases the size of a whole carriage. The same cases were already on the field in rows, but painted in camouflage colours. In these cases the jet fighters arrive by train from Russian plants. In Laerz they are assembled and tested."

When the MiG-15s returned from their morning test hop (which consisted of flying round and round the perimeter of the airfield in order that they would not be seen by prying eyes) he succeeded in taking a number of photographs of the fighters landing, and these shots confirmed every detail of the drawings published with a foregoing article in this series. It is rumored that the MiG-15 is to be delivered to the air arm of the East German Communist "Peoples' Police" which is intended to reach a final strength of 400,000 men. This new German Air Force, Soviet sponsored and trained, consists largely of ex-Luftwaffe pilots, and the first formations are to be formed this spring. The very fact of the existence of these MiG-15s in Germany refutes the optimists.

Designed by Artem I. Mikoyan and Mikhail I. Gurevich, the MiG-15 first began to enter service with the Soviet Air Force in 1948. It is a small fighter with a mid-set 35-degree back-swept wing spanning only 33 feet—the same as (Continued on page 58)

the same way as the Germans and Italians tested their latest equipment in the Spanish Civil War, is undoubtedly an advanced fighter and its appearance should act as a reminder that we do not possess any exclusiveness in the design of ultra-modern combat airplanes.

There are those who would try to persuade us that the relatively small quantities of this fighter that have appeared in various sections are purely for show purposes and that the type is not as yet widely used by the Soviet Air Force itself. How can these dangerous optimists explain away the indisputable fact that many hundreds of MiG-15s are available to the Soviet Air Force in the Eastern Zone of Germany? The runways of airfields at Grossenhain, Brandis, Laerz and Finow are lined with these fighters. A reporter who succeeded in breaking through the barriers at the Laerz Airfield one foggy night and hid there until dawn in order to take photographs, said in describing his adventure:







HUP-1, a smaller, all-metal version of the Flying Banana. Powered by a 525 hp air-cooled radial Continental engine, it was recently

ordered by the Navy for a variety of fleet uses. Rotor blades fold to facilitate below-deck storage. Useful load in excess of 1500 lbs.

# "Pi" and the Flying Banana

By WM. S. FRIEDMAN

**A latter-day Horatio Alger story of a model builder who became a leading plane manufacturer at 31**

■ "For outstanding contribution to the design and development of Helicopters"—so read the citation for the world-famed Lawrence Sperry Award that the Institute of the Aeronautical Sciences gives every year for notable contribution to the advancement of aeronautics by a young man. The distinguished audience of some eleven hundred which crowded the main ballroom of New York's Hotel Astor seemed pleased with the selection, as white-haired "Dutch" Kindelberger, the 1950 President of the Institute, presented the award to a dapper youngster, scarcely thirty-one, named Frank Nicholas Piasecki.

Frank Piasecki is the hero of a modern success story, and his, the tale of a nation that is still quick to recognize merit in a tangible form.

Born in Philadelphia in 1919, the only child of an immigrant tailor, young Frank grew up in the normal pattern of American kids. He early showed a talent for music, and his father had visions of his becoming



JULY, 1951



F7U-1 Cutlass



F-88 Voodoo

## Supersonic Killers

The U. S. is developing a new-breed of interceptor to deal with Hi-flying enemy bombers that may try to attack American cities

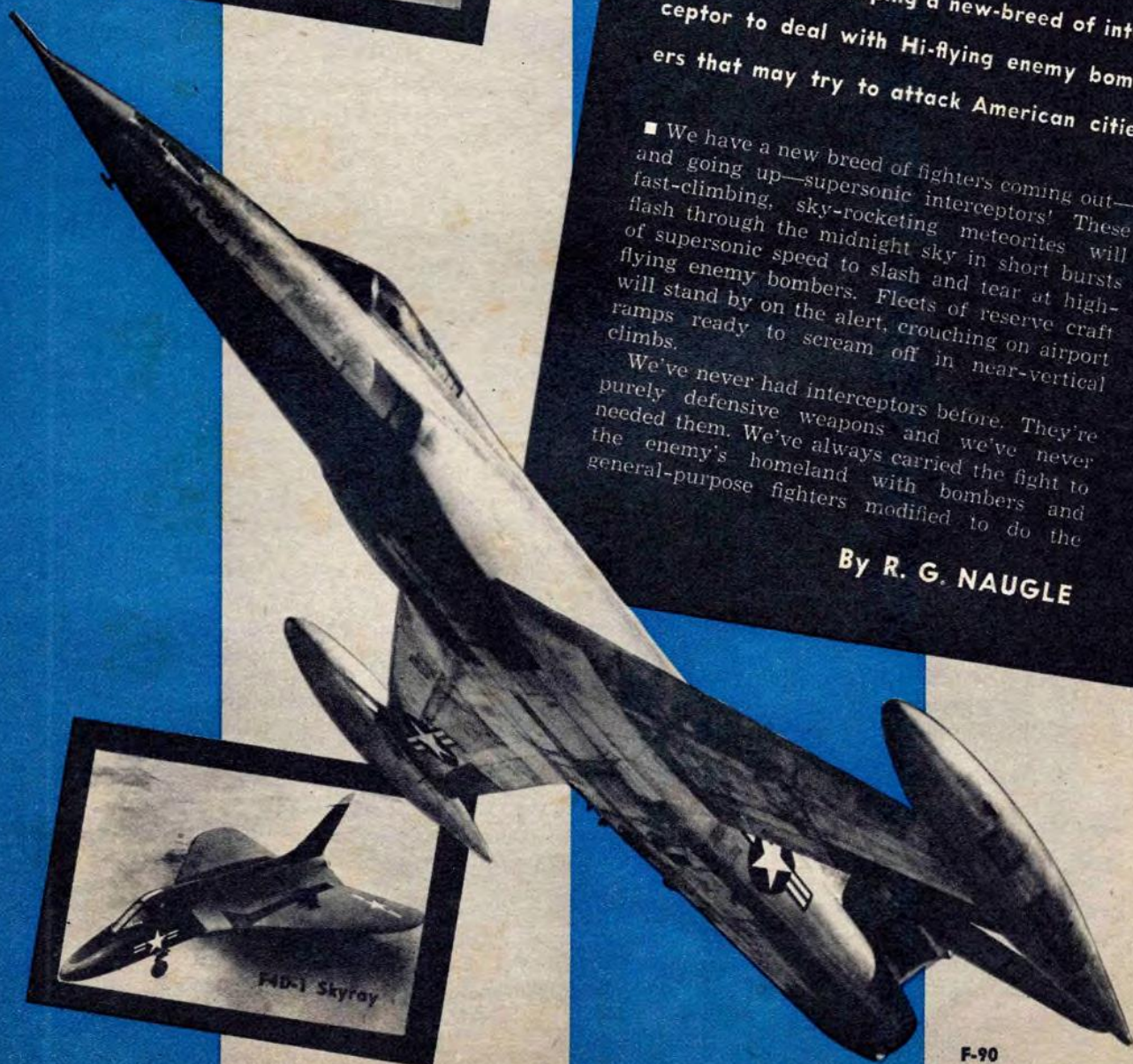
■ We have a new breed of fighters coming out—and going up—supersonic interceptors! These fast-climbing, sky-rocketing meteorites will flash through the midnight sky in short bursts of supersonic speed to slash and tear at high-flying enemy bombers. Fleets of reserve craft will stand by on the alert, crouching on airport ramps ready to scream off in near-vertical climbs.

We've never had interceptors before. They're purely defensive weapons and we've never needed them. We've always carried the fight to the enemy's homeland with bombers and general-purpose fighters modified to do the

By R. G. NAUGLE



F4D-1 Skyray



F-90



**The present-day interceptor, like the F-94C shown here, is only a stepping stone toward the full-fledged bomber-killer, agile at stratospheric heights and deadly with its rockets and electronic sights**



particular job. Some carried drop tanks and escorted bombers over long distances, and then fought off the enemy's defending interceptors over the target. Others, operating by themselves, carried a small arsenal of rocket projectiles, cannon and guns on tactical strikes to break up the enemy's ground defenses, transportation and communication systems.

We still need such fighters—penetration fighters, as they are now called. But modern war, like modern football, requires two teams, offensive and defensive. One team to score on the enemy, another to prevent him from scoring on you. We must still have penetration fighters, but we now need and will soon build a huge fleet of fast, goal-line defending supersonic interceptors to prevent enemy touchdowns on the North American continent.

Speed and ceiling of bombers now equal those of fighters since both, in the practical sense, are held back by the sonic barrier. For example, the F-86 and B-47 are

not only similar in general design but both have about the same top speed and maximum altitude capabilities. Both fighter and bomber can now closely approach the speed of sound with their thin sweptback wings and jet power, and both can achieve stratospheric altitudes undreamed of during World War II. And herein lies the rub—for fighters must chase, catch and shoot down bombers.

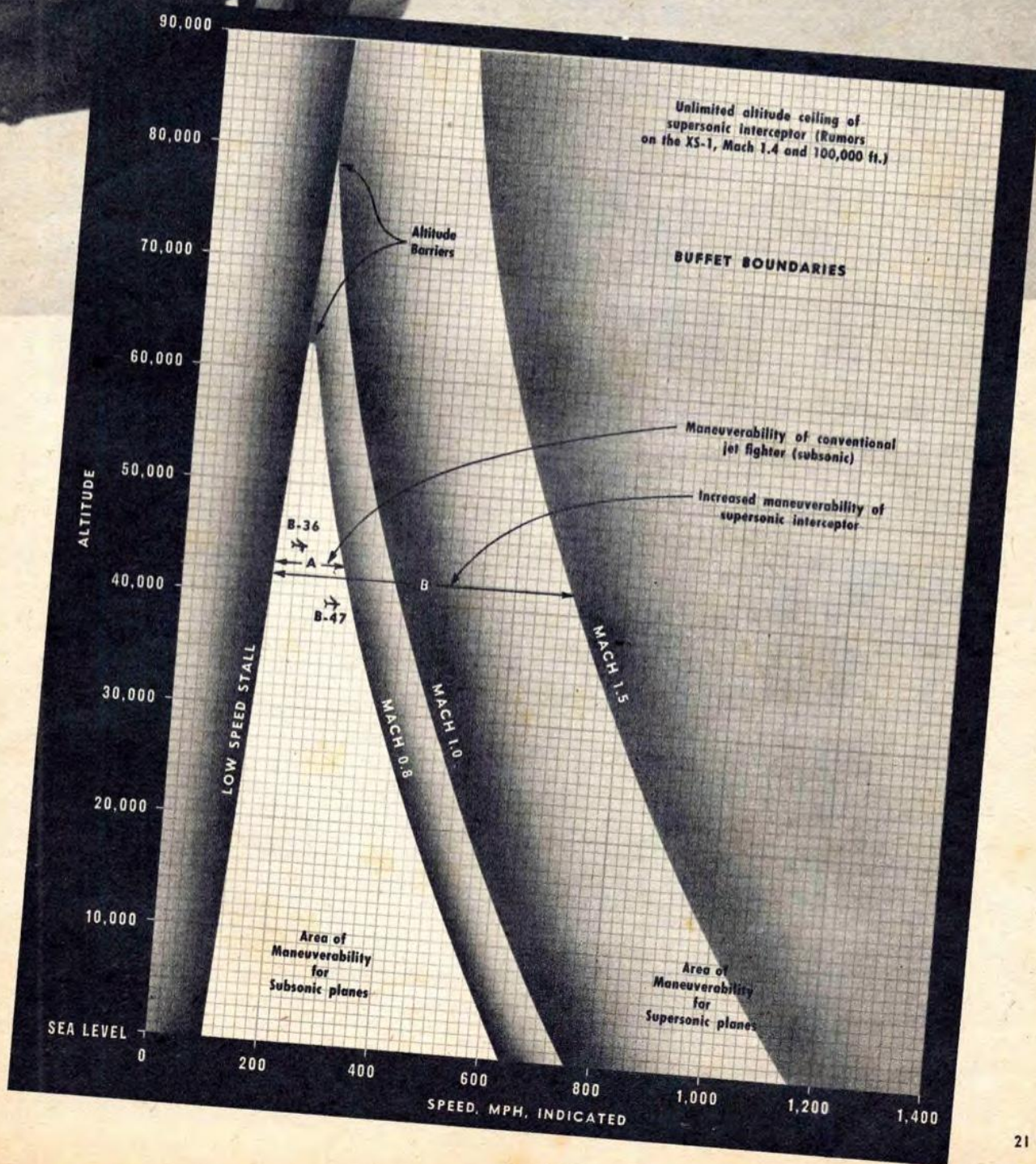
This means we *must* have supersonic interceptors, for not only must they fly faster than the speed of sound to overtake fast modern bombers, but they must also do so *in order to regain their maneuverability at extreme altitudes!* This is not generally appreciated. But a simple chart shows it quite clearly.

It is the chart of speed versus altitude that positively defines the limits *any* subsonic airplane must fly within. We know that an airplane must fly so fast to stay in the air—the normal low-speed stall. On the other hand, a subsonic airplane cannot fly faster than its critical Mach number—

some fraction of the speed of sound. "Buffeting" occurs in both cases, a breakdown of airflow over the wings and the sudden loss of lift. Therefore these limiting speeds are called the "buffet boundaries." If these speeds remained the same at all altitudes a plane could fly as fast and have the same maneuverability at high altitudes as it does near the ground. But they do not remain the same.

The stalling speed tends to increase with altitude while the critical Mach speed tends to decrease with altitude—thus squeezing the flyable speed range together until, at some altitude, the stalling speed equals the critical Mach speed. The altitude at which this occurs is sometimes called the "altitude barrier" since an airplane cannot fly any higher than this. The airframe as a heavier-than-air machine can no longer support itself in the air and fly as an airplane above this point. Power is not a factor. While considerable power is required for a plane to approach its altitude (*Continued on page 56*)





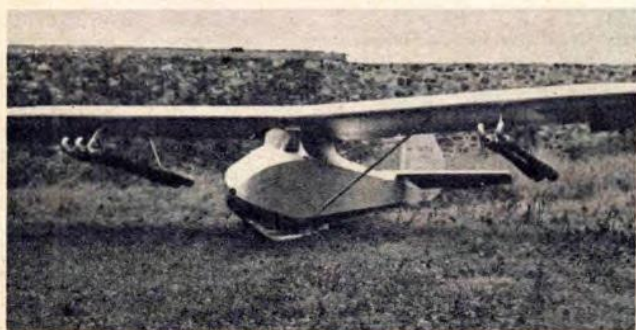




**Helicopter newcomer.** Two-place twin rotor McCulloch MC-4 by McCulloch Motors of Los Angeles, Calif., powered by 165 hp six-cyl. aircraft engine. Several will be built for Navy for evaluation tests.



## Development Highlights

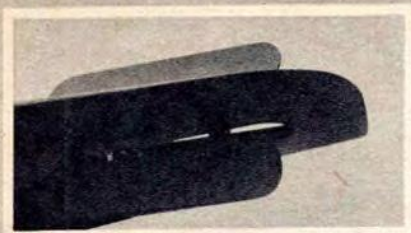


**Another French jet glider.** The Emouchet powered by four Escopette pulse jet engines each developing 22 lbs. of thrust. These do not use mechanical valve for power cycle; depend on turbulence for it.

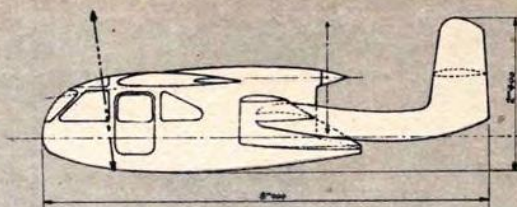


**A French experiment** in very high aspect ratio wing planes, Hurel Dubois HD-10. Aspect ratio is 32.5 to 1, wingspan 40 ft., wing chord 15.75 in. Powered by 75 hp engine. Ship flew successfully.

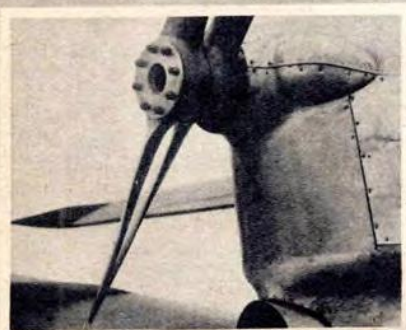




◀ Spoilerons



▶ Slotted prop



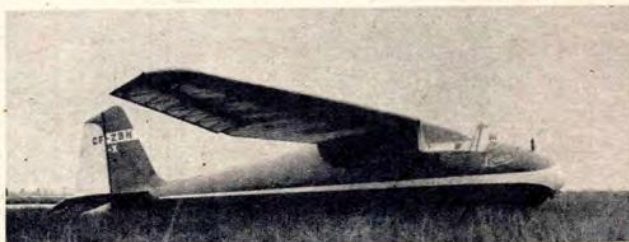
## Millet-Lagarde ML-10

An interesting approach to a stallproof airplane appeared recently in France designed and built by two engineers, M. Millet and J. Lagarde. Close-coupled biplane wing gives effect of slot which can be varied by the flap, connected up to the elevator. Spoilers on top of wing act as ailerons.

A fixed-pitch slotted propeller reduces the take-off run by 20% as compared to standard variable pitch screw. The ML-10 has proved exceptionally stable, the prototype making accurate landings at 31 mph. Because of slotted effect of biplane wing, lift is maintained up to an angle of 32 deg.



**Lockheed 1049, Super-Constellation.** Fuselage eight and a half feet longer than standard Connie, can carry 100 passengers, and has 3,500 hp engines. Eastern Airlines ordered 14 Super-Connies.



**UTG-1 Loudon** sailplane, designed and built by University of Toronto, holds the Canadian distance record with a flight by Frank Brame of 118 mi. from Toronto to Kingston. Good performance.



**The Beaver** in uniform. The popular Canadian bush plane designed and built by deHavilland of Canada will be used by USAF for liaison duty, designated as L-20. Has a P&W 450 hp engine. Span 48 ft.



**SE-2410 Grognaud**, French, single-place twin jet fighter, has air intake scoop above and behind pilot cockpit, giving it hunchback appearance. Engines are Rolls-Royce Nenes built by Hispano-Suiza.



AUGUST 1951 • 25 CENTS

# AIR TRAILS



**CHASE Wins  
JET RACE!**

see page 19



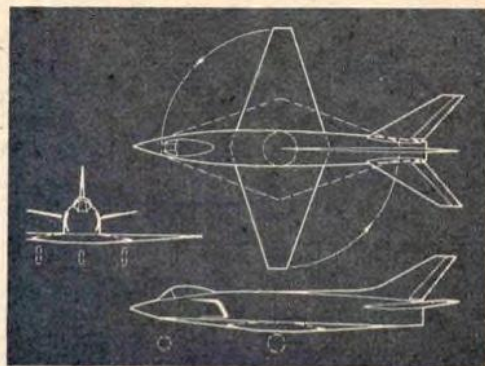
**Model World's First Rocket Plane**



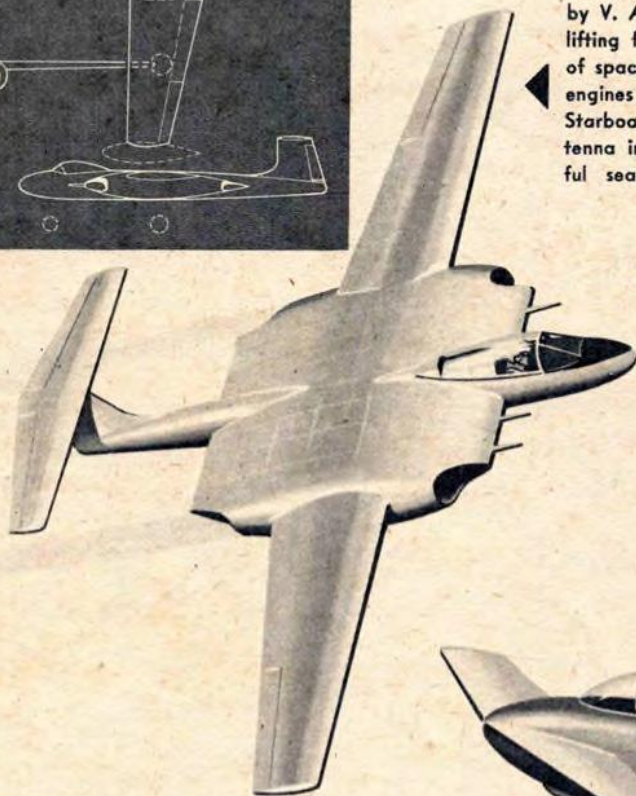
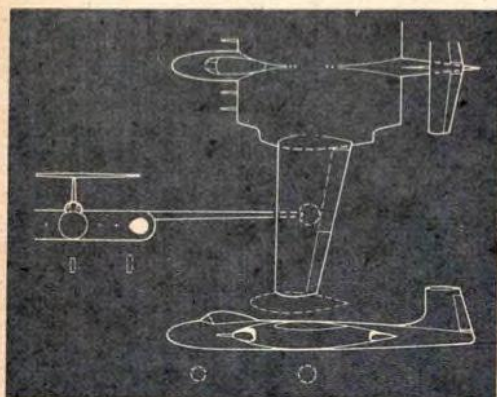
# Airmen of Vision

## DESIGN COMPETITION

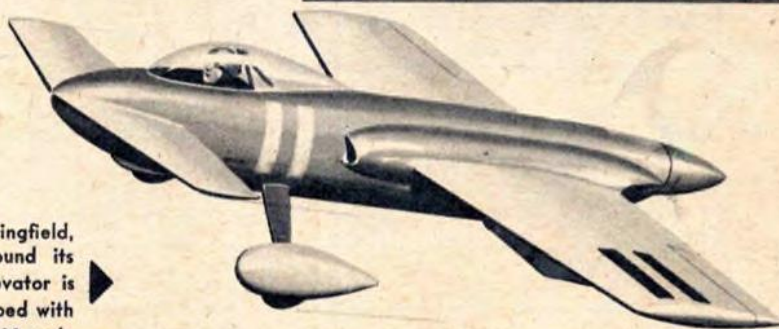
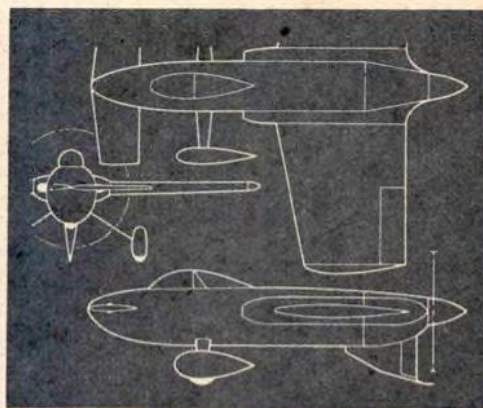
To J. J. Szakaacs of San Diego, Calif., go this month's honors for design of a variable wing area aircraft. By rotating wing, area is considerably reduced as well as span and a sweep angle of  $65^\circ$  achieved, suitable for supersonic flight in 2000 mph region. With wing in high-speed trim, roll is accomplished by use of elevons of horizontal tail, which has large surface area. Span 35 to 16 ft.



"Manta" (Devil Fish), an attack bomber by V. A. Davis of Portsmouth, Va., uses lifting fuselage idea which gives plenty of space for the two 5000 lb. thrust jet engines and the self-sealing fuel tanks. Starboard wing tip carries radar antenna in streamlined housing. A powerful searchlight is on port wing tip.



A 190 cu. in. canard midget racer by John S. Moore of Springfield, Mo. Elevator has no stabilizer, entire unit rotating around its longitudinal axis. Not too good an idea as such type elevator is apt to be oversensitive and devoid of feel. Should be equipped with anti-servo tabs. Span 15 ft., length 15 ft. Estimated speed 200 mph.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than  $8\frac{1}{2} \times 11$  inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

Judges. The designs may be of any type: commercial aircraft, military planes (fighters) bombers, troop transports, planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



A black and white photograph of a man in a dark uniform and cap, standing on a structure and working on a large, delta-wing aircraft model. The model is light-colored and has a very sharp, pointed nose. The background is a cloudy sky.

# the Changing Air World

In the beginning there was the dream. The dream was followed by fragile machines, first in model form, then as wood, wire and canvas contraptions which culminated in the Wright biplane. During those early days of flight the pilot was king to his public, a slave to his plane. He was designer, builder, mechanic. Two great wars changed all that. Today is the time of the technician. Never before has there been such demand for the draftsman, the designer, the mechanically inclined. This intent young man at NACA's Wallops Island (Va.) station is helping to usher in another era—one in which the airplane will part company with the pilot. He is shown with a Delta-wing, rocket-powered research model used to obtain aerodynamic data on wing shapes, stability and control effectiveness. The dream changes. . . .





# U.S. FIRST ALL-JET TRANSPORT

*This latest "powered glider" by Chase, 100% jet, can take off and land in 600 feet!*

With a complete lack of fanfare, an approach quite different from the current way of presenting new planes, Chase Aircraft of West Trenton, N. J. has put the first all-jet-powered assault transport into the air. This epochal achievement brings new honors to Michael Stroukoff, Chase's chief engineer and one of the most unorthodox figures in the U.S. aviation industry. The XC-123A all-jet transport is the revamped Chase XG-20 cargo glider powered by four Allison J-47 jet engines paired in pod type nacelles for a total of 20,800 pounds of thrust. The remarkable aircraft can take off and land in 600 feet—less space than required by a jet fighter! Some trick for a transport that grew up from a glider!



*Principal Chase designs showing evolution from gliders to present assault transport*



Twenty-three-place YCG-14A glider with metal fuselage, wood covering. Flew in '45.



All-metal YG-18A glider capable of carrying thirty. Flown in '47. Span 86 ft. 4 in.



What stands out most at first sight of the XC-123A and other Chase planes is the long, narrow, high aspect ratio wings—an uncommon feature in aircraft whose task is to act as aerial trucks. Within these wings lies the performance formula of all Stroukoff planes: ability to get in and out of very small fields, and high speed in the air. Stroukoff did not leaf through the NACA volumes to select a proper airfoil for his planes—he designed it himself. A versatile and brilliant engineer and architect who built bridges, railroads and theaters, he applied his knowledge of hydrodynamics to the problem of obtaining the highest possible efficiency out on a wing.

The result has been notably successful. Chase planes can hop in and out of fields with the agility of Cubs, and the prop-driven ones hit better than 200 mph in level flight. Despite the bulky fuselage characteristics, these planes are well streamlined at the juncture of wings and tail surfaces, a factor greatly reducing drag. Their deep fuselage and high-mounted wing permit use of an exceptionally low landing gear arrangement. This not only saves weight but precludes damage to the engines in the event of a wheel-up landing. The bottom of the fuselage is heavily reinforced to withstand belly landings, while the cockpit is beefed up with an internal tubular structure in case of head-on





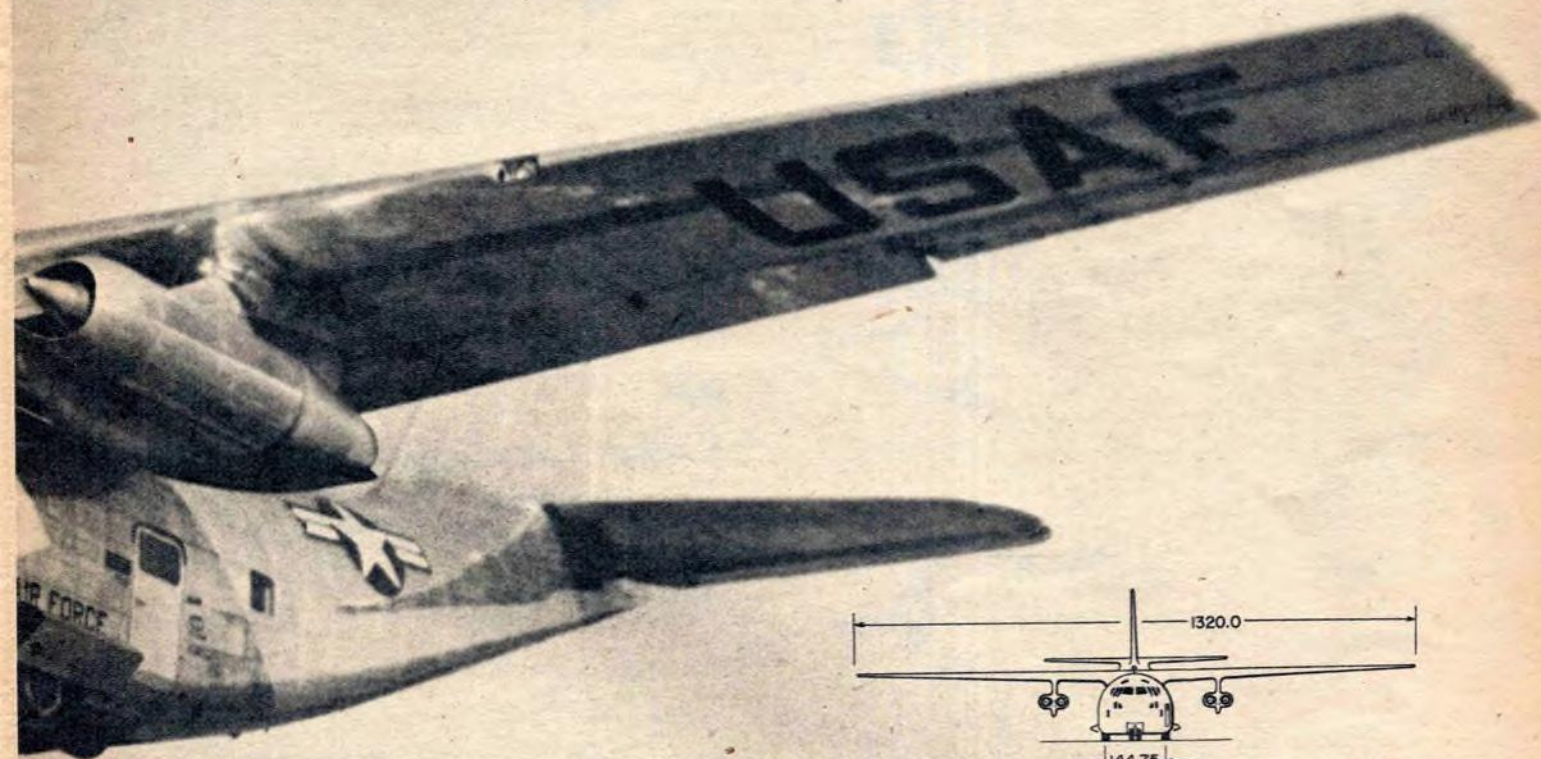
Powered version of G-18A was C-122, first truly successful glider-to-powerplane.



Largest glider ever built in U.S. was XG-20 with capacity for more than 60 passengers.



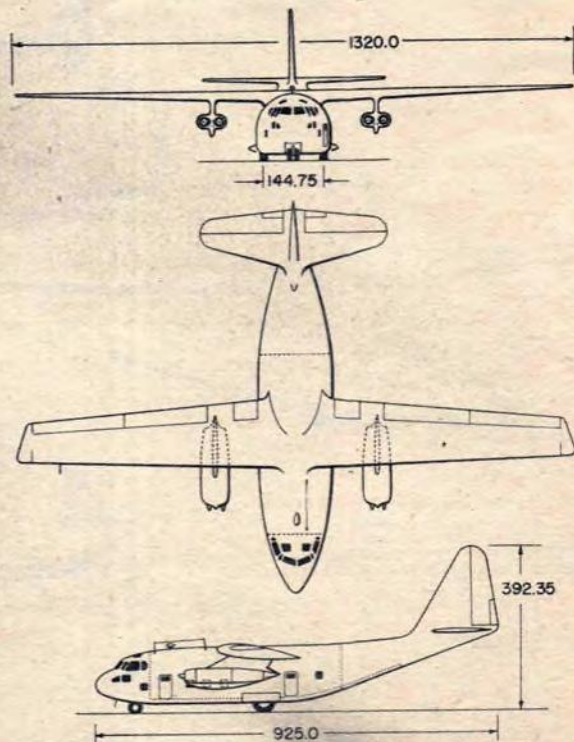
XC-123 came from XG-20; wt. 25,000 lbs. empty; payload 20,000 lbs. +; range 1335 mi.



collision with obstacles during military operations.

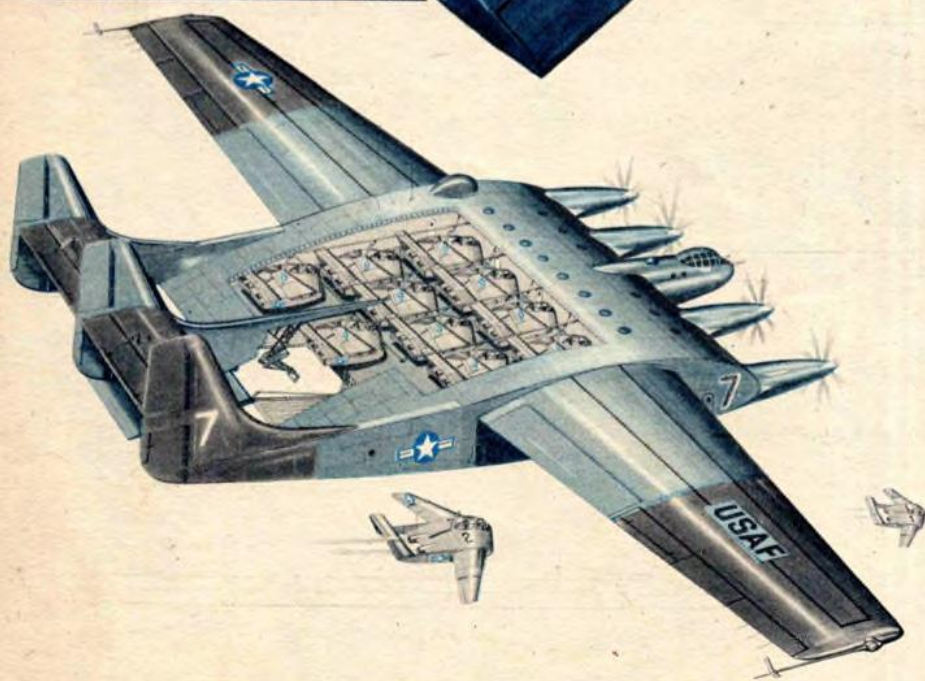
In the past, many attempts were made to convert gliders into power planes by hanging engines on the wings. The Germans did it with the boom-tail Gotha GO-242 and the 181-ft.-span Messerschmitt Me-321; the British with the Hamilcar, and we ourselves mounted various powerplants on the Waco CG-4. None of them came near the performance of the Chase machines. To top it all, these aircraft can tow one another, if necessary.

Thus, Russian-born Mike Stroukoff joins the two other notable Russian designers, Sikorsky and Sever-sky, in contributing to American aviation.





# ***Flying Flattops***







## Aerial carriers are another solution for interception of fast long-range enemy A-bomb raiders

■ The shadow of the A-bomb bears heavily over American cities. . . . Yet if we depend on the conventional radar-flak-plane setup to defend our major areas from a Red-A attack, it would take a force the size of the Normandy invasion to protect eleven of our most important cities, and that with only 40 to 50 percent effectiveness. Guided missiles, which appear to be our best bet from the standpoint of accuracy and economy, are at least three years in the future.

The place to stop the Red bombers headed for Detroit is over the Arctic Ocean, not over Lake Huron. This problem calls for a type of interception similar to an aircraft carrier, in locations and at conditions of speed and altitude where the carrier is out of its element. Thus the solution, for the time being, is to project aircraft carrier characteristics into the sky to meet the enemy more than halfway.

Experience with our B-36 bombers indicates that the current type of fighter suffers from certain disadvantages when attacking a bomber, and one of the best ways to restore its position of combat superiority and still permit it to be used against bombers a long way from the target, is the flattop in the sky.

For exploration of this idea, Vincent J. Burnelli "designed" an airplane, or rather a flying task force, that would be able to cope with the current problem. The Flying Flattop is a four-engined aircraft a little larger than the B-36, an adaptation of Burnelli's airfoil fuselage idea. It has a lifting body 80 ft. by 80 ft., with outboard wing panels bringing the span to a total of 250 ft. The plane is 120 ft. long and would be powered by four 10,000 hp gas turbines.

The front and sides of the airfoil fuselage would be devoted to crew facilities and to search radar. Because of its size and capacity, some five tons of radar equipment could be carried with radar antenna as large and accurate as those of any ground station.

Inside the fuselage, most of the area would be occupied by the hangar housing a full dozen Burnelli-type fighters embodying the same lifting fuselage characteristics and powered by two jet engines. To increase range, the fighters would be equipped with a telescoping wing system which allows a section of the wing to slide in and out, folding wings and tail booms to facilitate stowage.

Planes would be carried inside an overhead trolley system hung on a retractable hook. They would be launched and recovered through a trap-door forming a portion of the lower fuselage skin and sliding back like a Fowler flap. In the event of action, the first two fighters launched would act as protectors for the flattop, taking position above and below the mother ship, with the other ten going after the enemy. Their relative low wing loading would give them an advantage over the invading bombers. The flattop would have provision for in-flight refueling of the fighters, and as most refueling equipment is reversible, the carrier could take on fuel in flight, increasing the length of time for remaining out on patrol.

Burnelli also points out that such an aircraft would not become obsolete with the advent of guided missiles, as it represents an ideal platform for air launching of air-to-air or even air-to-ground missiles.



# AIR PROGRESS

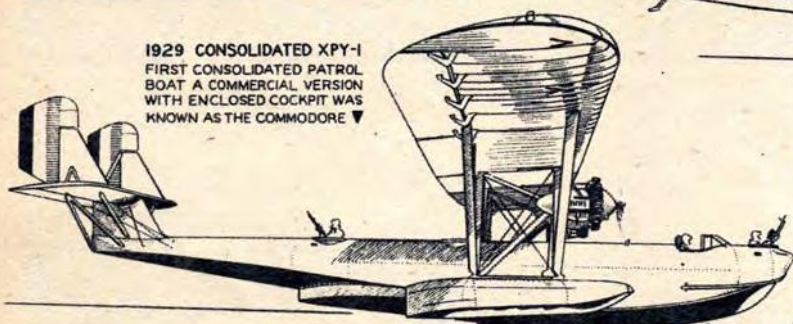
By DOUGLAS ROLFE

## THE CONSOLIDATED VULTEE STORY

◀ 1923 CONSOLIDATED TW-3  
FIRST CONSOLIDATED PRODUCTION  
WAS THIS SIDE-BY-SIDE SEATING  
MILITARY TRAINER. WITH 150-H.P.  
HISCO-WRIGHT ENGINE THE TW-3  
WAS ACTUALLY DESIGNED BY THE  
FORMER DAYTON-WRIGHT FIRM.



1929 CONSOLIDATED XPY-1  
FIRST CONSOLIDATED PATROL  
BOAT A COMMERCIAL VERSION  
WITH ENCLOSED COCKPIT WAS  
KNOWN AS THE COMMODORE ▼



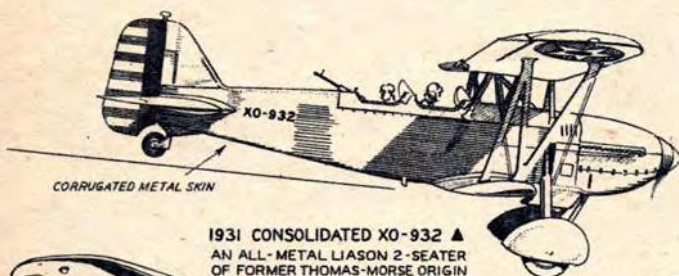
1928 CONSOLIDATED PT-3 ▲  
(THE FAMED "HUSKY" OR "TRUSTY")



▲ 1929 CONSOLIDATED "FLEETSTER"  
(TYPE 17) 6-PASSENGER COM. TRANSPORT



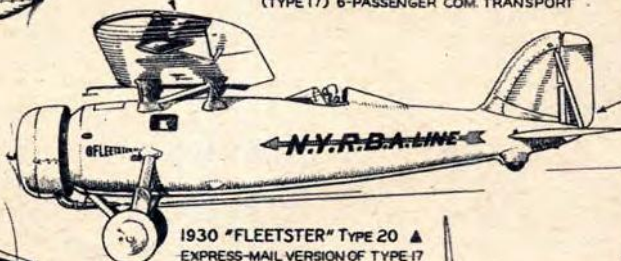
1931 CONSOLIDATED XO-932 ▲  
AN ALL-METAL LIASON 2-SEATER  
OF FORMER THOMAS-MORSE ORIGIN



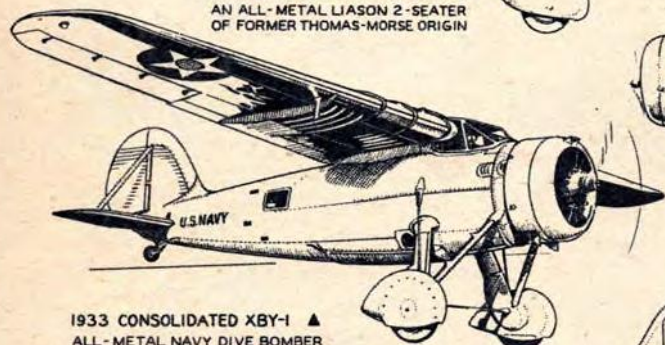
PLYWOOD SKIN  
TYPE WING

ALL-METAL FUSELAGE  
AND TAIL ASSEMBLY

1930 "FLEETSTER" TYPE 20 ▲  
EXPRESS-MAIL VERSION OF TYPE 17

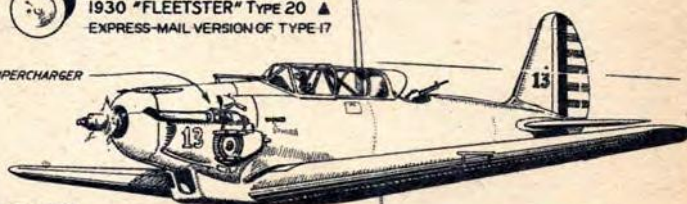


1933 CONSOLIDATED XBY-1 ▲  
ALL-METAL NAVY DIVE BOMBER

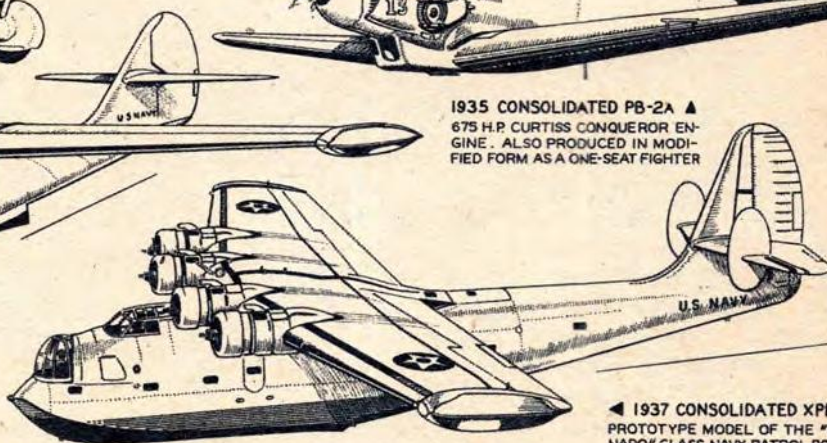
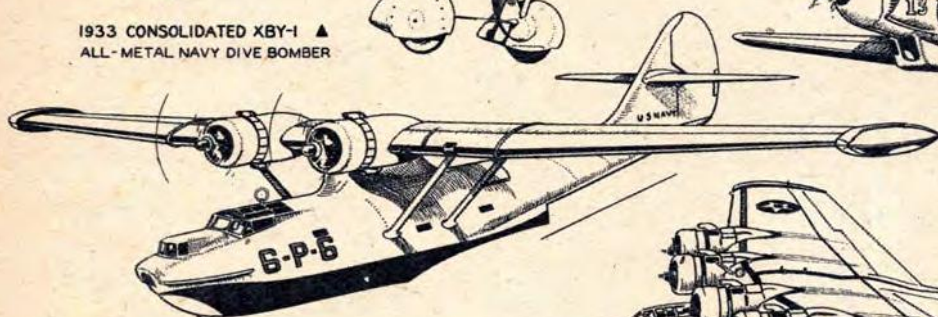


SUPERCHARGER

1935 CONSOLIDATED PB-2A ▲  
675 H.P. CURTISS CONQUEROR EN-  
GINE. ALSO PRODUCED IN MODI-  
FIED FORM AS A ONE-SEAT FIGHTER



1936 CONSOLIDATED PBY-1 "CATALINA" ▲  
WITH VARIOUS MINOR MODIFICATIONS THE FABU-  
LOUS CATALINA BECAME ONE OF MOST WIDELY  
USED LONG-RANGE PATROL BOATS OF WORLD WAR 2  
AND BECAME EQUALLY FAMOUS AS A RESCUE SHIP



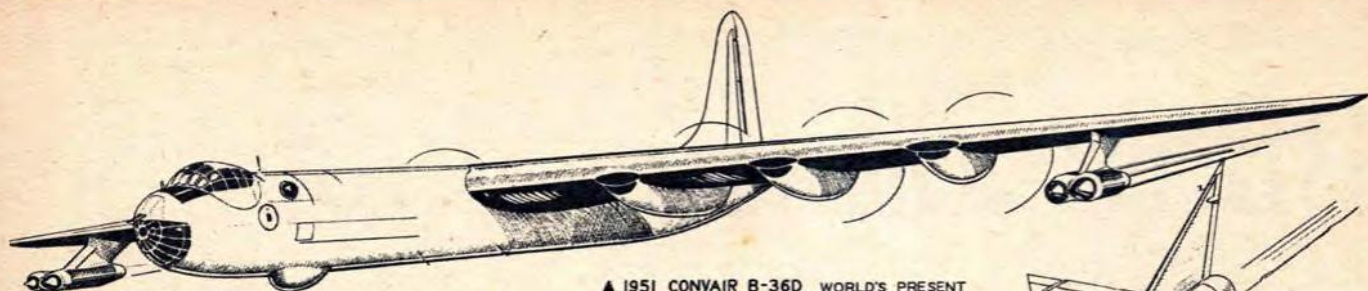
◀ 1937 CONSOLIDATED XPB2Y-1  
PROTOTYPE MODEL OF THE "CORO-  
NADO" CLASS NAVY PATROL BOMBER

The Consolidated Vultee story at first glance begins in the early Forties when these two major aviation companies merged to form the present one. However, each in turn had previously absorbed much older aviation firms, so that the present management is actually linked up with the fledgling days of flight. Consolidated itself was founded by Maj. Reuben H. Fleet in 1923, at which time it took over the old Dayton-Wright and even more "ancient" Gallaudet com-

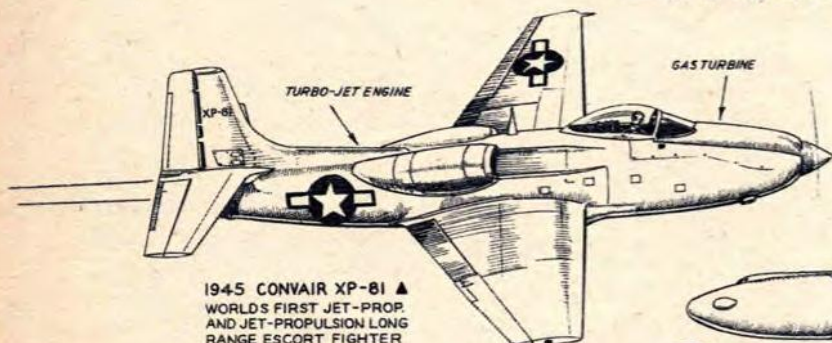
panies. Having also acquired the assets of the famous Thomas-Morse outfit, it produced at least one Thomas-Morse design under its own label.

Consolidated's initial fame stems from the long line of military trainers it produced in the Twenties. Their very nicknames—the "Husky," the "Trusty"—give some indication of the rugged, foolproof characteristics of these ships. Early turning to all-metal construction, Consolidated furthermore

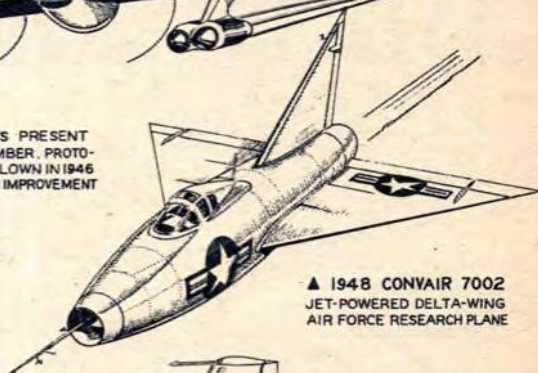




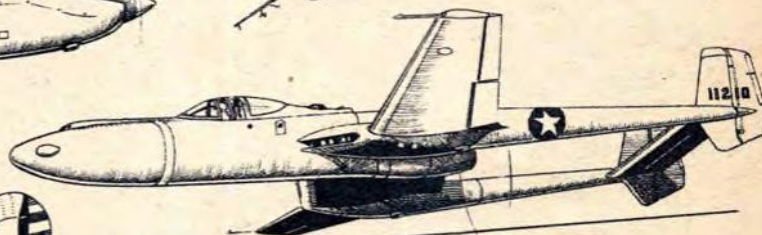
▲ 1951 CONVAIR B-36D WORLD'S PRESENT LARGEST, LONGEST-RANGE SUPERBOMBER. PROTOTYPE MODEL, THE XB-36, WAS FIRST FLOWN IN 1946 WITHOUT JET PODS—LATEST DESIGN IMPROVEMENT



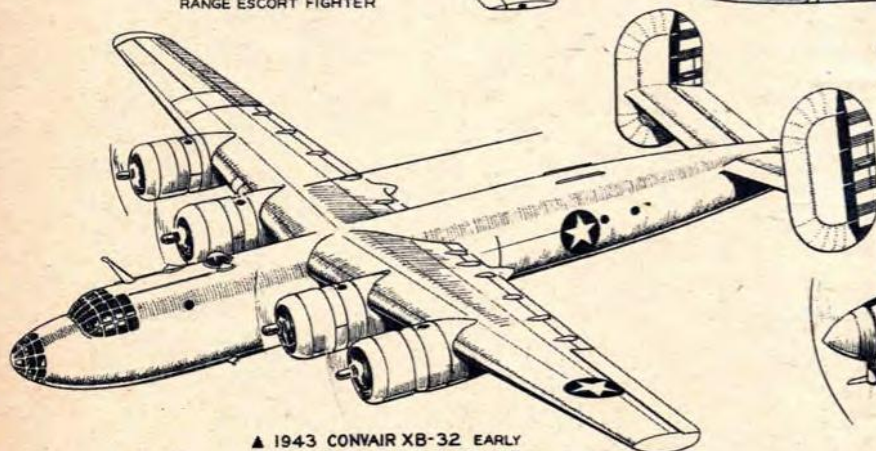
1945 CONVAIR XP-81 ▲  
WORLD'S FIRST JET-PROP.  
AND JET-PROPULSION LONG  
RANGE ESCORT FIGHTER



▲ 1948 CONVAIR 7002  
JET-POWERED DELTA-WING  
AIR FORCE RESEARCH PLANE



▲ 1943 CONVAIR XP-54 AN INTERESTING VULTEE EXPERIMENTAL FIGHTER STILL IN THE DEVELOPMENT STAGE AT TIME OF MERGER. NOVEL FEATURE WAS THE POWER OPERATED ENTRANCE ELEVATOR WHICH ALSO DOUBLED AS A PILOT'S SEAT EJECTOR WHEN NEEDED



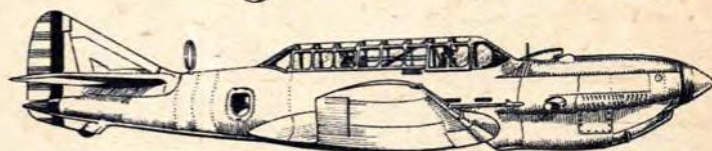
▲ 1943 CONVAIR XB-32 EARLY STEP IN THE DEVELOPMENT OF THE B-32 "DOMINATOR". PRESSURIZED FUSELAGE, TWIN RUDDER ARRANGEMENT, WERE DROPPED IN FINAL MODEL



▲ 1939 VULTEE "VANGUARD"  
PROTOTYPE MODEL OF THE P-66 WHICH, WITH MODIFIED COWLING, WENT INTO PRODUCTION IN 1941



1939 VULTEE MODEL 54 ▲  
PROTOTYPE OF FAMED BT-13  
"VALIANT" BASIC TRAINER. IN  
WORLD WAR 2 MORE THAN 11,500  
"VALIANTS" WERE PRODUCED!



1940 VULTEE XA-19A ATTACK PLANE ▲  
ONE OF THE FIRST (AND RARE) VULTEE TYPES  
TO USE A LIQUID-COOLED (LYCOMING) ENGINE



▲ 1937 VULTEE V-11-GB 3-PLACE ATTACK PLANE  
MODIFICATION OF TYPE V-11—FIRST (1936) MILITARY VULTEE

◀ 1933 VULTEE V-1 FIRST VULTEE PRODUCED WAS THIS ALL-METAL 8-PASSENGER COMMERCIAL TRANSPORT POWERED WITH A 735 H.P. WRIGHT ENG.

DOUGLAS  
ROLFE

pioneered in the field of large all-metal flying boats. Vultee was started by Jerry Vultee in 1932, and links up by various means with the old Stinson firm. A top-notch aviation engineer and pilot, he concentrated from the beginning on all-metal, stressed-skin design. A few of the Vultee designs appear on the right-hand page. Their advanced nature for the time and period will be at once apparent. The present-day Convair company (Consolidated Vultee

Aircraft Corporation) is currently engaged in producing commercial airliners besides many world-renowned military designs. It also makes pilotless aircraft, guided missiles and other items in the restricted project class.

The illustrations are arranged as far as possible to show separately the development of Consolidated and Vultee types. Many notable designs, such as the B-24 Liberator, are omitted as they appeared in Air Progress previously.



# Development.....



This neat little home-made biplane was originally built in 1933 by a Curtiss engineer and bought in 1949 by E. Smith of Delaware who rebuilt and modernized it.



The Texas Bullet, a new all-metal 4-place personal plane built by Aircraft Mfg. Co., Tyler, Tex. Engine 205 hp Continental, span 28 ft., length 23.15 ft., 190 mph tops.

Sikorsky YH-18A helicopter for Army Field Forces. Note unusual fixed horizontal stab. Powered by a 245 hp flat six Franklin engine, top speed of 113 mph, room for 4.





# ..... Highlights



Another Texas all-metal plane, the Regent Rocket, by Regent Aircraft Corp., Henderson, Tex. Seats five, designed by R. S. Johnson. Powered by 260 hp. engine.



Fouga Gemeaux (twins). Now the French went and done it. Two Fouga Sylphe jet powered sailplanes joined together. Top speed 185 mph. +, ceil. 20,000 ft.



Lockheed P2V-5, latest version of the famous submarine patrol plane. Note large radome on underside of fuselage. Turbo-Cyclone compound engines, 3250 hp. each.



# AIR TRAILS



**starting this issue...**

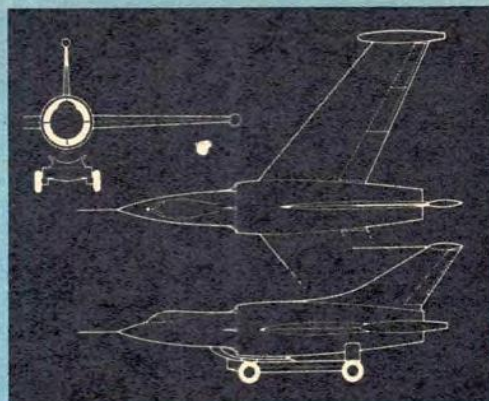
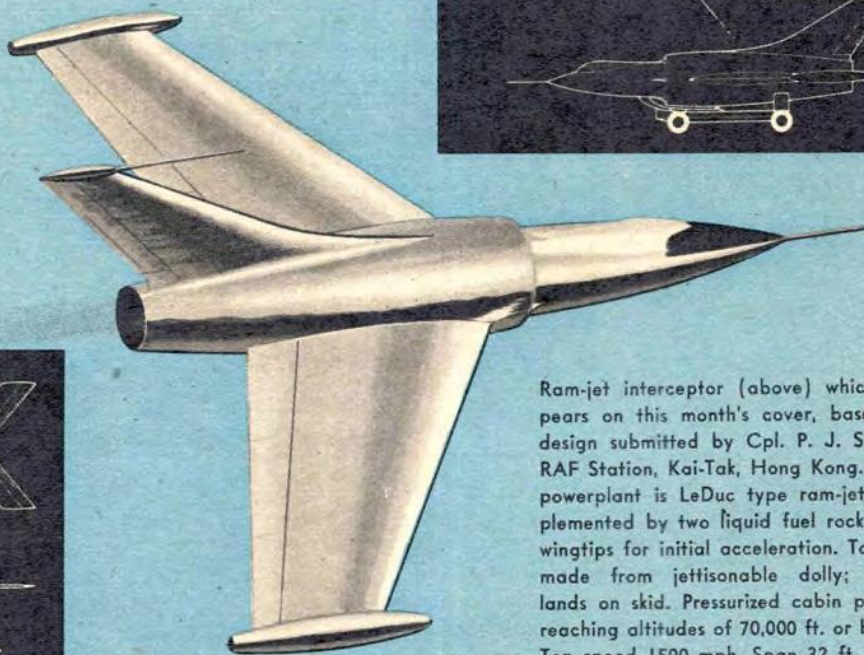
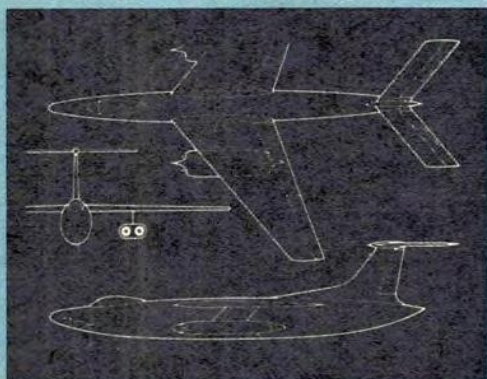
**MORE AIR-MODEL  
PLANS & FEATURES!**



# Airmen of Vision

## DESIGN COMPETITION

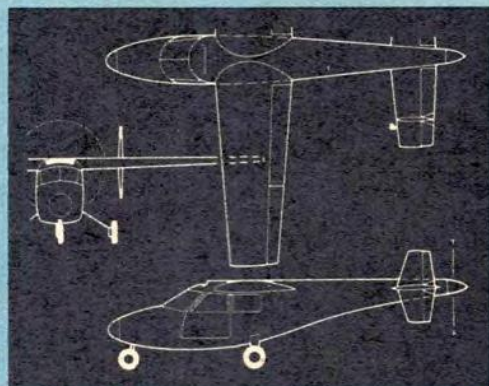
Four-engine bomber (below) by Erwin Ewry of Chicago, Ill. A neat, clean design which should give excellent performance. Plane has wingspan of 69 ft., 40 deg. sweepback; length 57 ft. Power plants: four 5200 lbs. thrust jet engines paired in two nacelles. Armament: machine guns in nose, internally stowed bombs and rockets. This type of armament is well suited for ground support duty. Speed 750 mph, range 2000 mi.



Ram-jet interceptor (above) which appears on this month's cover, based on design submitted by Cpl. P. J. Snodin, RAF Station, Kai-Tak, Hong Kong. Main powerplant is LeDuc type ram-jet, supplemented by two liquid fuel rockets at wingtips for initial acceleration. Take-off made from jettisonable dolly; plane lands on skid. Pressurized cabin permits reaching altitudes of 70,000 ft. or better. Top speed 1500 mph. Span 32 ft.



Five-place, single-engine pusher personal plane (right) by David McElroy, of Los Angeles, Calif. Engine located above and behind pilot at center of gravity for better controllability. Driving a propeller in rear of fuselage through extension shaft, the 185 hp flat-six is cooled by air entering through scoop at cabin top. Span 34 ft., length 30 ft., max. speed 150 mph. Normal cruising range 600 mi.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

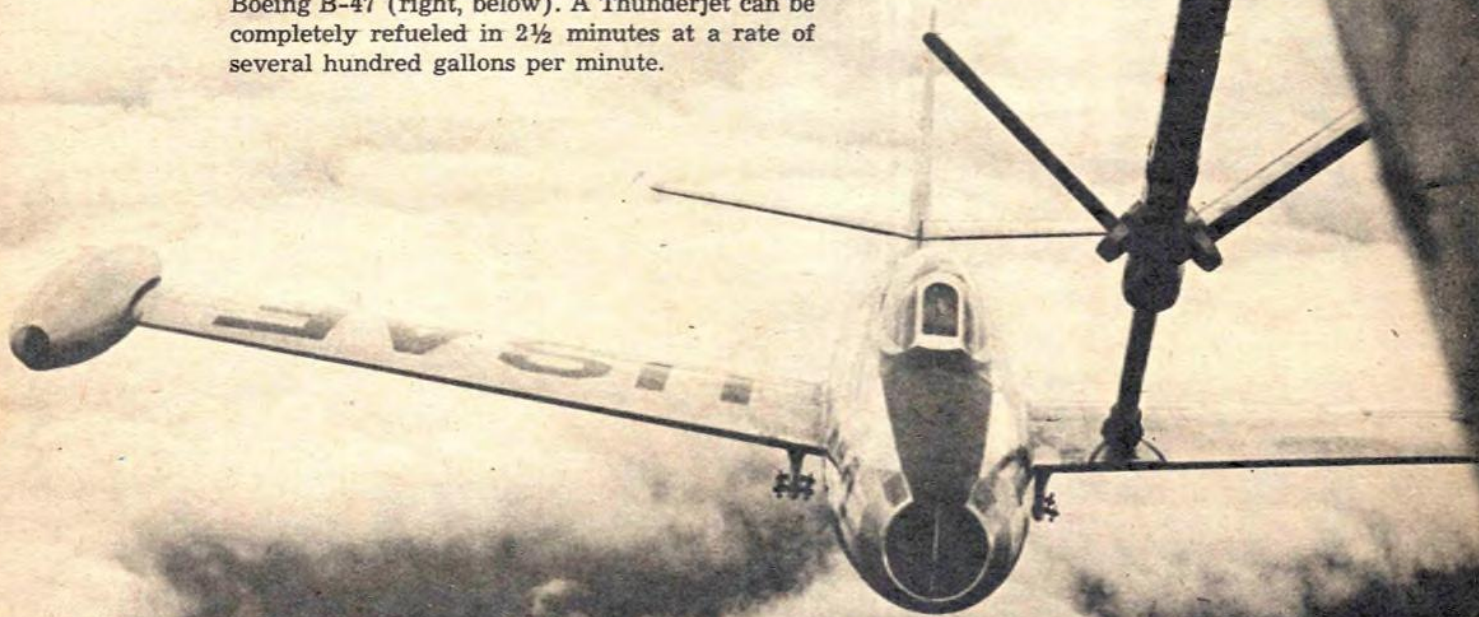
Judges. The designs may be of any type, commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



# EVERYBODY'S DOIN' IT!

■ First operational jet fighter to roll off the production line fully equipped for mid-air refueling by tanker plane is this F-84G Republic Thunderjet. Here it is being refueled from a Boeing KB-29P Superfortress. Single-point in-flight refueling heralds the beginning of an era of increased flexibility and mobility for U.S.A.F. fighter forces.

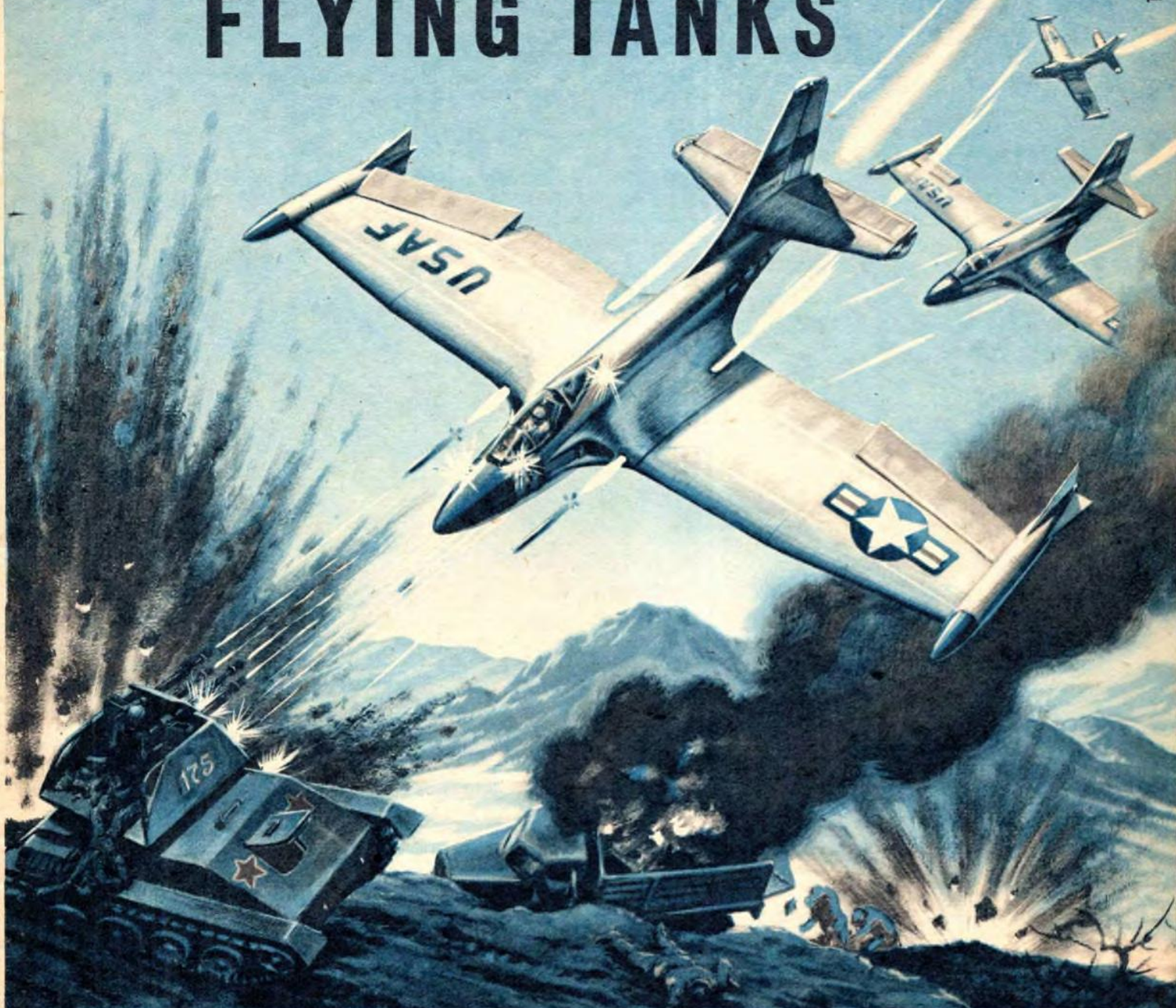
The F-84G's refueling system is designed for use with the Boeing-developed flying boom method of in-flight refueling. This is the same system employed for the mid-air refueling of the North American RB-45C (left, below) and the Boeing B-47 (right, below). A Thunderjet can be completely refueled in 2½ minutes at a rate of several hundred gallons per minute.





**AMERICA'S NO. 1 NEED . . .**

# FLYING TANKS



■ A tough, heavily armored ground-strafting plane, which can bull its way in through clouds of flak, deliver its big punch and get out again in one piece is considered the No. 1 need of the Air Force. The current super-speed, hi-flying fighter plane, costing around half a million, loaded with special gadgets useful only at altitude is pretty much wasted in ground attack work, say the

ground forces. Skimpily armored and wide open to any kind of flak, quite a few were brought down or badly beaten up in Korea by everything from burp gunfire to showers of hand-heaved stones. Now that the jets have proven to be unusually stable gun platforms and fully capable of efficient, on-the-deck operations, the logical development is an expendable Flying Tank.

**Text and Art by FRANK TINSLEY**



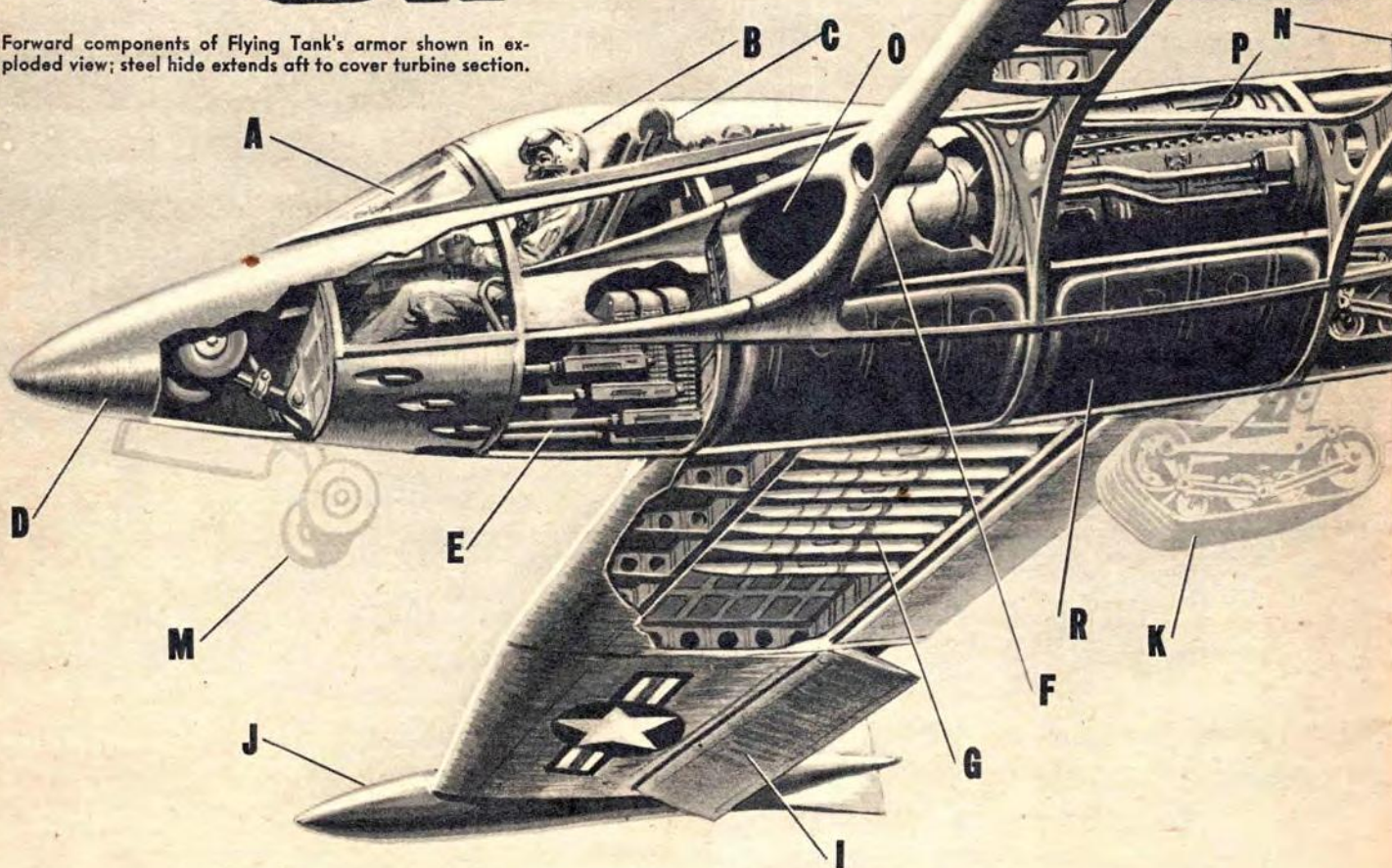
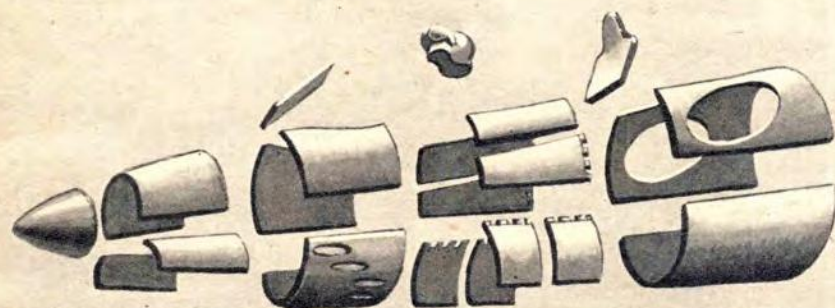
Grover Loening, veteran designer and N.A.C.A. consultant believes the 10,000 lb. thrust jet engine now makes possible an attack plane as heavily armored as any tank. The jet eliminates the vulnerable propeller and provides sufficient power to lift the armor's great weight.

The Flying Tank must be a highly expendable item designed for inexpensive mass production. The wing should be made of easily replaceable panels, squarish in plan form and with constant section and chord wherever practicable; it must be lightly loaded and of great area. This is not too much of a liability as it permits the use of internal rocket magazines and the new, Navy automatic launcher. Removable tip tanks for long-range ferrying would be interchangeable with Napalm or H. E. bombs.

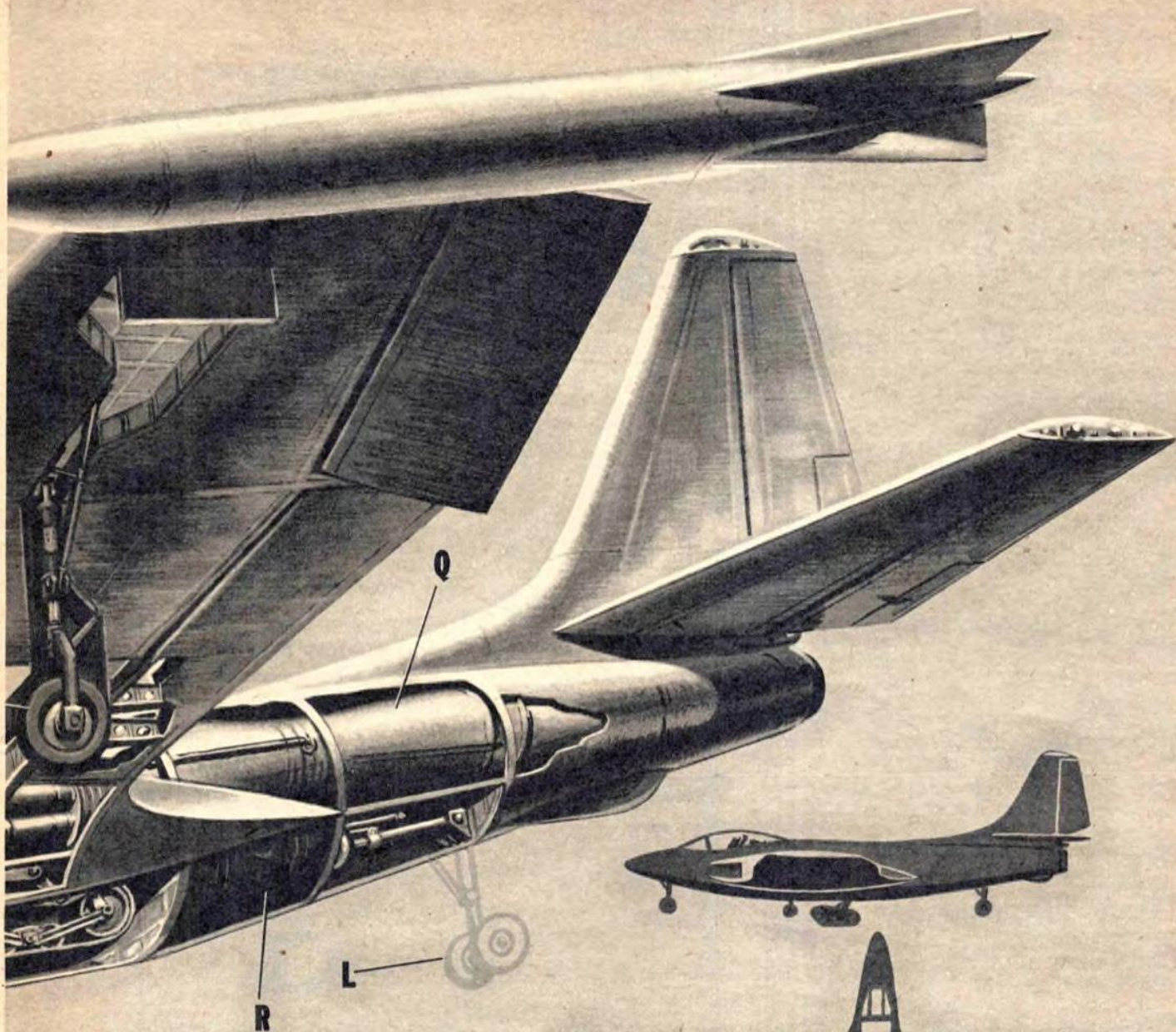
To avoid the possibility of frontal fire penetrating to the compressor, the intake duct is of the "Y" type with ports in the wing roots, well outboard of the engine. The latter, complete with an afterburner for combat boost, is mounted in the upper half of the fuselage. Below it, separated by a floor type firewall, are the fuel cells with the new, English explosion retarders.

An unusually rugged landing gear handles the outside loads developed. A track type main gear, slung beneath the fuselage just aft of the C.G., absorbs the initial impact.

The Flying Tank is not a pretty plane but neither is the job it is designed to do. With the ever-increasing importance of efficient ground support aviation, it has a distinct place in our combat team.

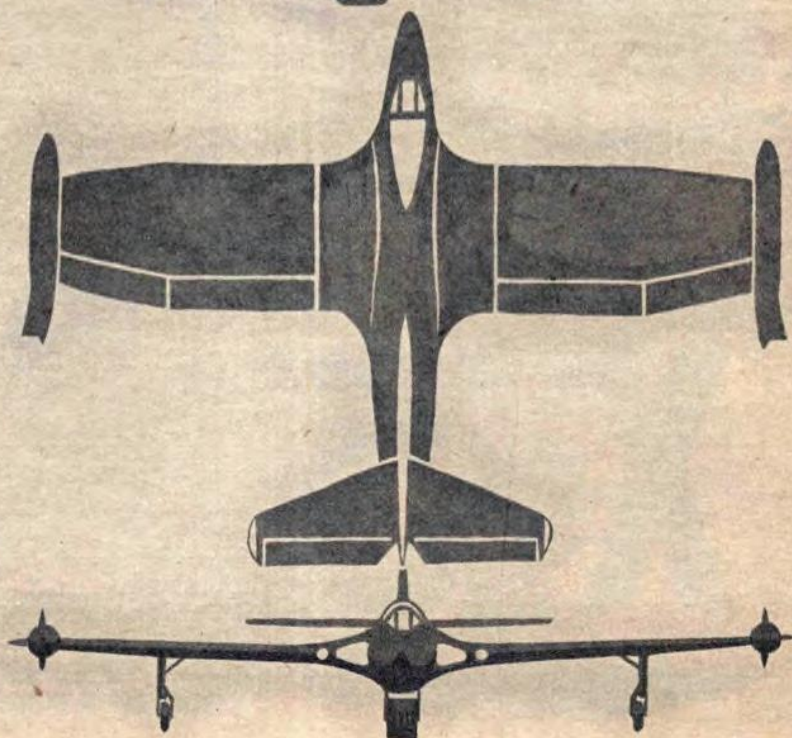




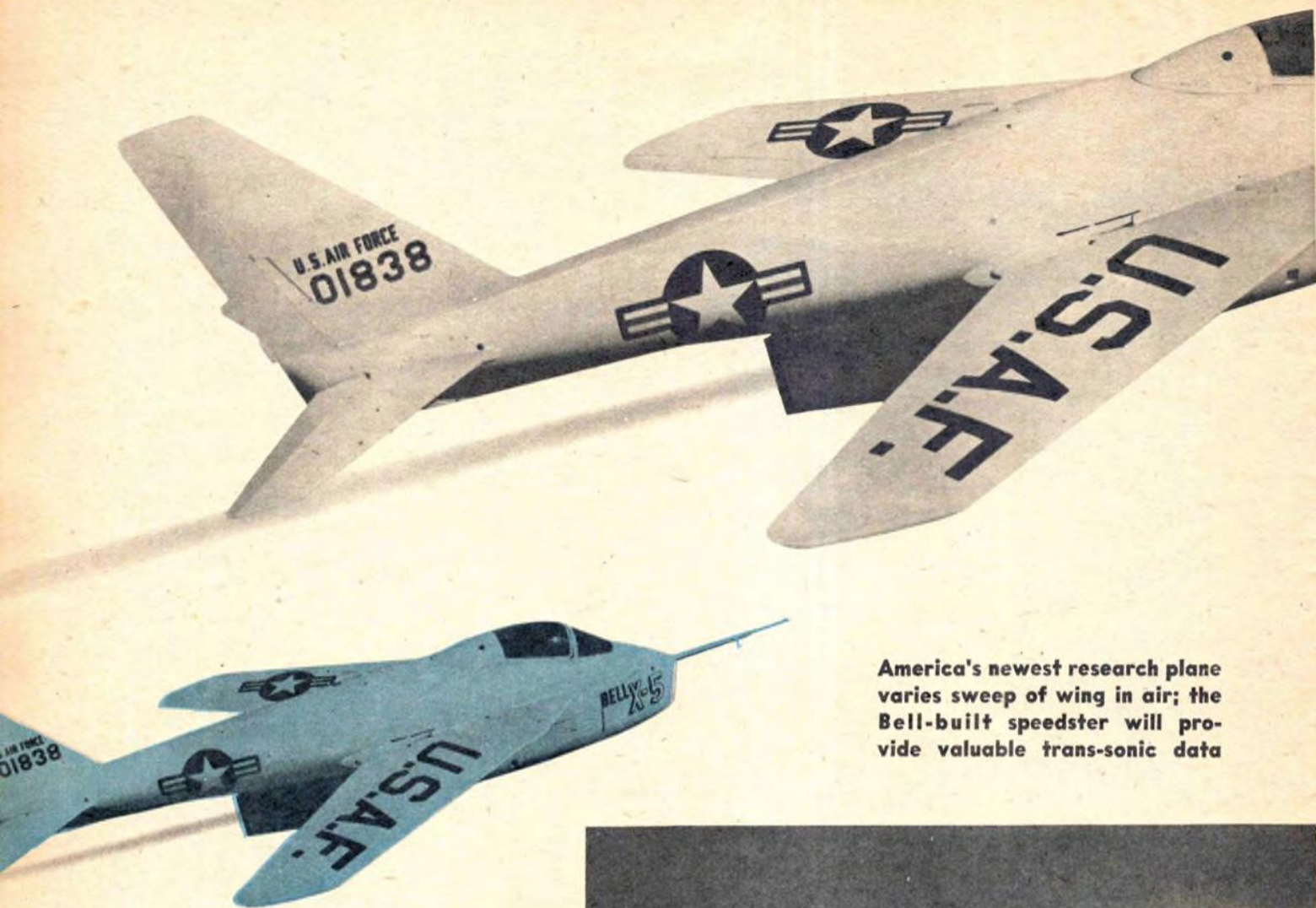


### IMPORTANT FEATURES OF THE FLYING TANK

- A—Bullet-proof windshield
- B—Pilot's flak-proof helmet
- C—Rear cockpit armor
- D—Heavily armored nose cone
- E—Six 20-mm shell guns
- F—Rifled auto, rocket launcher
- G—Rocket magazine in inner wing panel
- H—Large area wings to carry weight of armor
- I—Northrop type "deceleron" aileron/air brake
- J—Wingtip fuel tanks or Napalm bombs
- K—Main track landing gear to take heavy impact
- L—Tail wheels for initial landing
- M—Ship drops onto nose wheels after initial impact is absorbed
- N—Steadying side wheels for taxiing
- O—Divided engine air intakes
- P—10,000 lb. thrust axial jet engine
- Q—Afterburner
- R—Self-sealing fuel coils







America's newest research plane varies sweep of wing in air; the Bell-built speedster will provide valuable trans-sonic data

# X-5







■ Bell's X-5 "flying guppy," the first aircraft with variable sweep wings, will have all the advantages of conventional wing aircraft in take-off and climb, then can increase its sweep-back in flight while simultaneously compensating for the resulting shift of the center of gravity. Built for NACA trans-sonic speed studies, X-5 is 33' 4" long, 12' from ground to tip fin. Wingspan is 32' 9"; weight, approx. 10,000 lbs. Pitot tube boom is an additional 8'. Power is 4,900 lb. thrust axial flow Allison J-35-A-17 turbo-jet engine slung under the cockpit. Unlike Bell's X-1, the new research plane will take off under its own power and is capable of sustained flight over longer periods. The enameled white plane has leading edge slats in the wings to increase lift and reduce stalling speed. Bell is also working on the X-2, a rocket-powered research craft with sweptback wings with some parts made of stainless steel, as well as X-1A, X-1B and X-1D.



Each wing of Flying Guppy has specially designed fairing so leading edge presents smooth airfoil regardless of angle; two dive brakes in sides forward of cockpit provide rapid deceleration.

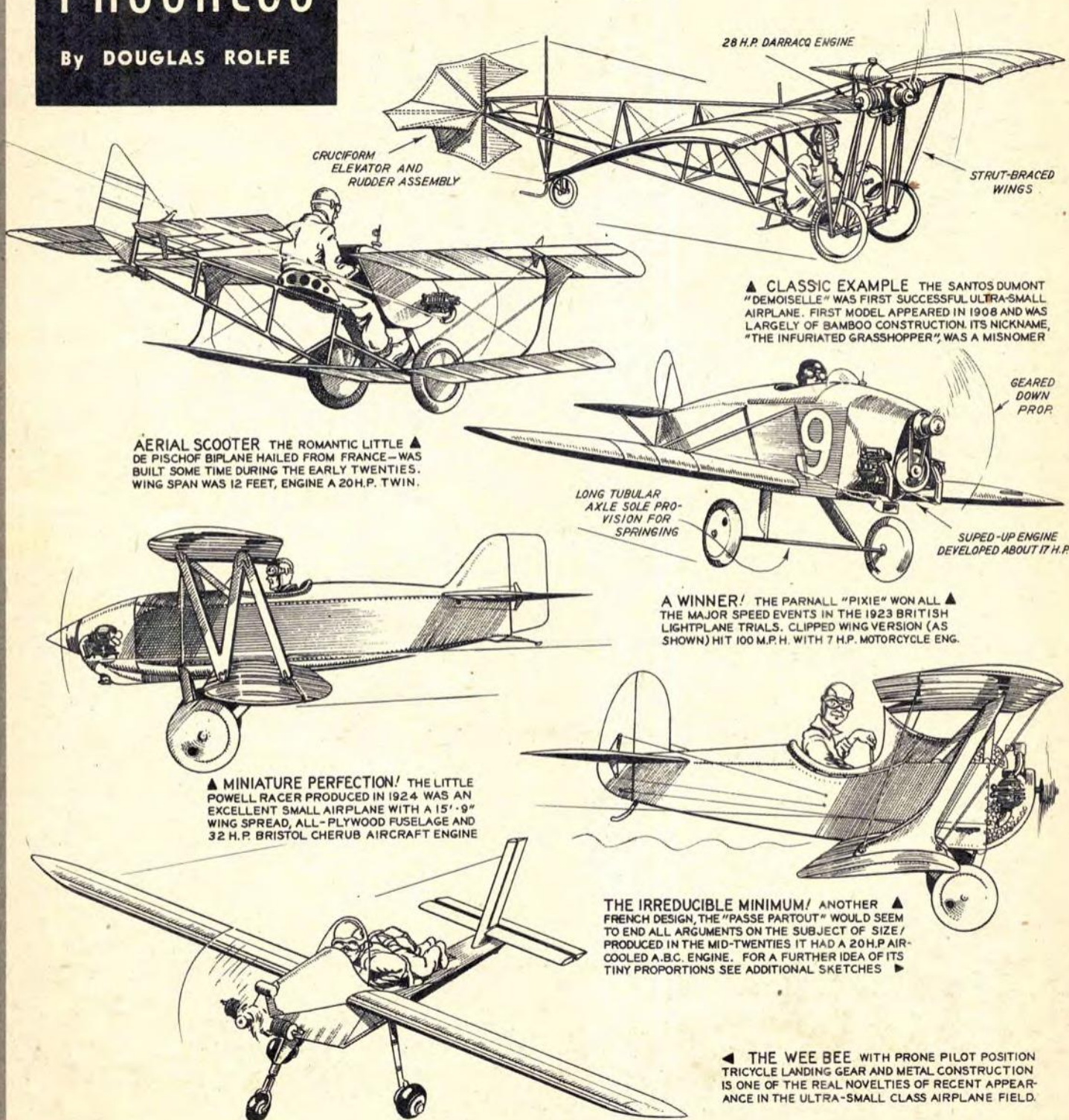




# AIR PROGRESS

By DOUGLAS ROLFE

## WEE ONES: Some Successful Ultra-Small Planes



▲ CLASSIC EXAMPLE THE SANTOS DUMONT "DEMOISELLE" WAS FIRST SUCCESSFUL ULTRA-SMALL AIRPLANE. FIRST MODEL APPEARED IN 1908 AND WAS LARGELY OF BAMBOO CONSTRUCTION. ITS NICKNAME, "THE INFURIATED GRASSHOPPER", WAS A MISNOMER

▲ AERIAL SCOOTER THE ROMANTIC LITTLE DE PISCHOF BIPLANE HAILED FROM FRANCE—WAS BUILT SOME TIME DURING THE EARLY TWENTIES. WING SPAN WAS 12 FEET, ENGINE A 20 H.P. TWIN.

▲ A WINNER! THE PARNALL "PIXIE" WON ALL THE MAJOR SPEED EVENTS IN THE 1923 BRITISH LIGHTPLANE TRIALS. CLIPPED WING VERSION (AS SHOWN) HIT 100 M.P.H. WITH 7 H.P. MOTORCYCLE ENG.

▲ MINIATURE PERFECTION! THE LITTLE POWELL RACER PRODUCED IN 1924 WAS AN EXCELLENT SMALL AIRPLANE WITH A 15'·9" WING SPREAD, ALL-PLYWOOD FUSELAGE AND 32 H.P. BRISTOL CHERUB AIRCRAFT ENGINE

▲ THE IRREDUCIBLE MINIMUM! ANOTHER FRENCH DESIGN, THE "PASSE PARTOUT" WOULD SEEM TO END ALL ARGUMENTS ON THE SUBJECT OF SIZE. PRODUCED IN THE MID-TWENTIES IT HAD A 20 H.P. AIR-COOLED A.B.C. ENGINE. FOR A FURTHER IDEA OF ITS TINY PROPORTIONS SEE ADDITIONAL SKETCHES ▶

◀ THE WEE BEE WITH PRONE PILOT POSITION TRICYCLE LANDING GEAR AND METAL CONSTRUCTION IS ONE OF THE REAL NOVELTIES OF RECENT APPEARANCE IN THE ULTRA-SMALL CLASS AIRPLANE FIELD.

How small can the airplane be? Well, judging by some of the samples shown on these pages, there have been quite a number of little ships built over the years which despite their diminutive size can qualify as real airplanes rather than powered gliders.

First truly small successful airplane was undoubtedly the

Santos Dumont "Demoiselle" which flew quite well with very small pilots, but had a time getting unstuck when larger pilots tried it. Audemars and Garros, both men of decidedly small stature, hung up several records with this tiny ship.

Exact figures on some of the older designs are difficult to come by nowadays, but all the types illustrated here were



CURTISS-REED ONE-PIECE  
DURALUMIN PROPELLER

AILERONS ON UPPER  
AND LOWER WINGS



AILERONS ON UPPER  
WINGS ONLY



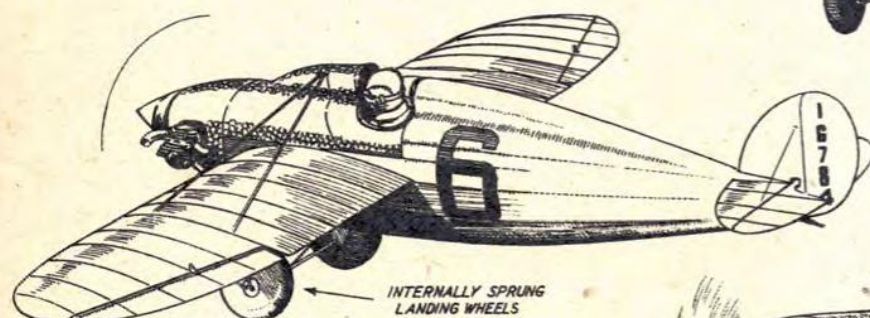
▲ MYERS MIDGET THIS 16-FOOT  
SPAN RIGID-TRUSS BIPLANE WAS ONE  
OF THE MOST ORIGINAL DESIGNS BUILT  
FOR THE 1924 U.S. LIGHTPLANE CLASS  
CONTEST. — MAXIMUM SPEED 90 M.P.H.

20 H.P. 2-CYCLE METEORMOTOR  
WEIGHED ONLY 60 POUNDS



▲ AN ITALIAN VENTURE  
THE BRED A TRIPLANE DATES FROM  
THE EARLY TWENTIES. WINGSPREAD  
WAS 13 FEET — TOP SPEED 106 M.P.H.

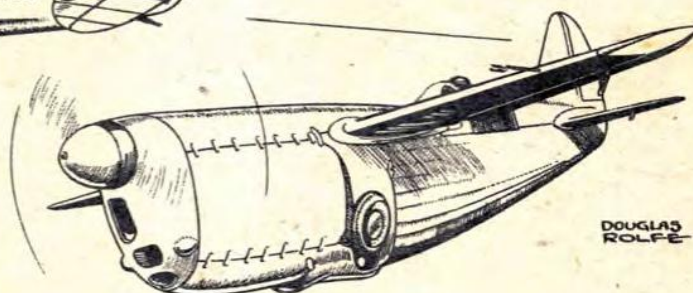
AILERONS ON LOWER  
WINGS ONLY



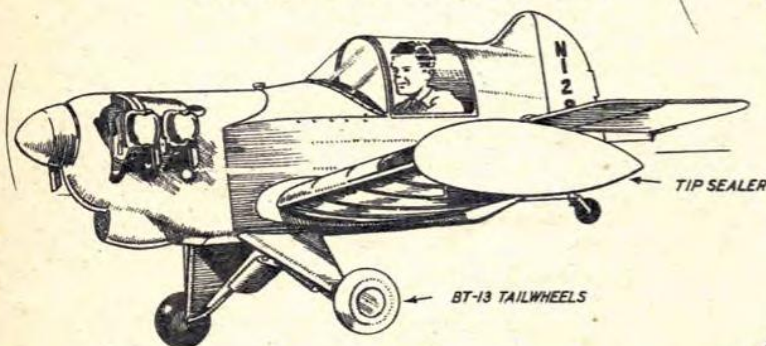
▲ SMALL BUT GOOD THIS WAS LAST  
SMALLEST AND FASTEST VERSION OF THE  
METEORPLANE, ONE OF THE MORE SUCCESS-  
FUL U.S. ULTRA-SMALL AIRPLANE DESIGNS  
PRODUCED IN THE MID-TWENTIES. SPAN WAS  
14 FT. 6 IN. — CLAIMED TOP SPEED, 140 M.P.H.

INTERNALLY SPRUNG  
LANDING WHEELS

▲ ONE OF THE BEST YET AVIATION ENGINEERS  
TODAY MIGHT LEARN SOMETHING FROM THE HEATH  
"BABY BULLET" DESIGNED 23 YEARS AGO. WITH A  
32 H.P. ENGINE THIS EXTERNALLY BRACED MID-WING  
MONOPLANE HAD A MAXIMUM SPEED OF OVER 150 M.P.H.



DOUGLAS  
ROLFE



A NOSY CHARACTER! THE FLOYD ▲  
BEAN "SPECIAL" HAD A MERE 12-FT. WING-  
SPREAD BUT PROMINENT NOSE COWLING HID  
A 400-H.P. ENGINE. — TOP SPEED, 350 M.P.H.

▲ THE LAST WORD! CURRENT HOLDER OF TITLE  
TO CLAIM AS WORLD'S SMALLEST AIRPLANE THE STITS  
JUNIOR HAS A WINGSPREAD OF ONLY 8 FT. 9" MOUNTS  
AN 85 H.P. CONTINENTAL ENGINE, HITS OVER 170 M.P.H.



U.S. STITS JR.



FRENCH "PASSE PARTOUT"

WORLD'S SMALLEST ?

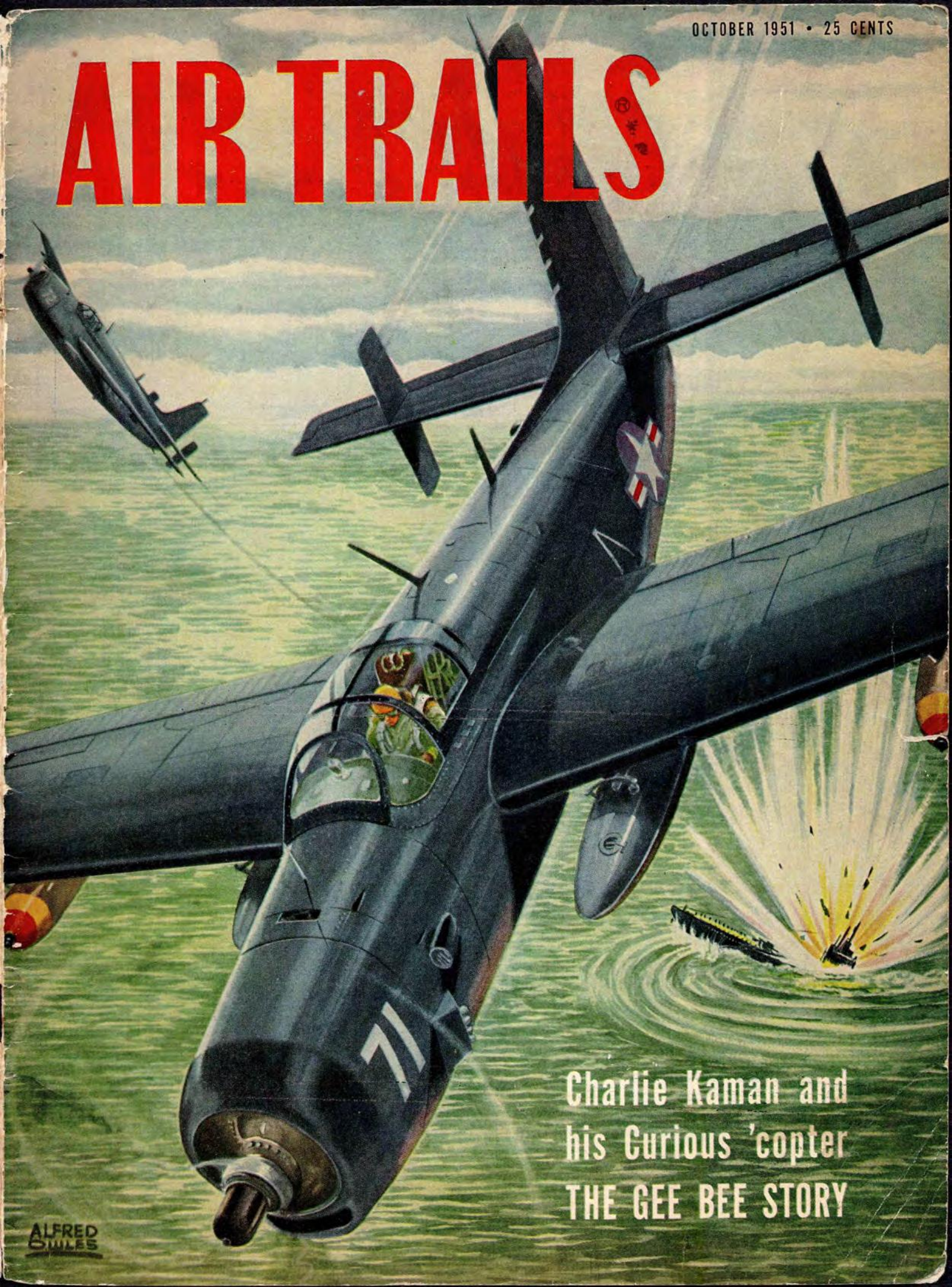
actually built and flown and none exceeded 18 feet in wing-spread. Best of the older designs were probably the Heath "Baby Bullet," the Parnall "Pixie" and the Irwin "Meteorplane," in that order. First and last designs mentioned had genuine aircraft engines; the "Pixie" relied on a small, hotted-up motorcycle engine. Yet even with this drawback

it flew well and had a most extraordinary turn of speed. Chief objection to the ultra-small airplane is that despite its eye appeal it is not too comfortable to fly and is apt to be very tricky. Note: Designs selected are only a few of the more interesting junior-size airplanes produced over the years. The challenge involved has fascinated many builders.



OCTOBER 1951 • 25 CENTS

# AIR TRAILS



Charlie Kaman and  
his Curious 'copter  
THE GEE BEE STORY

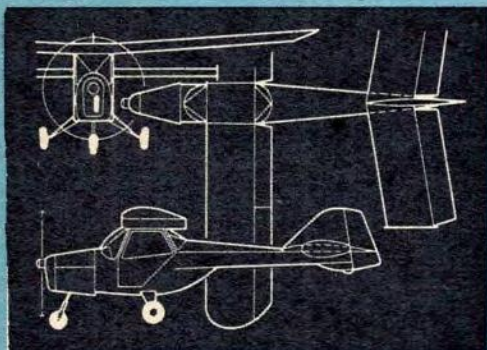
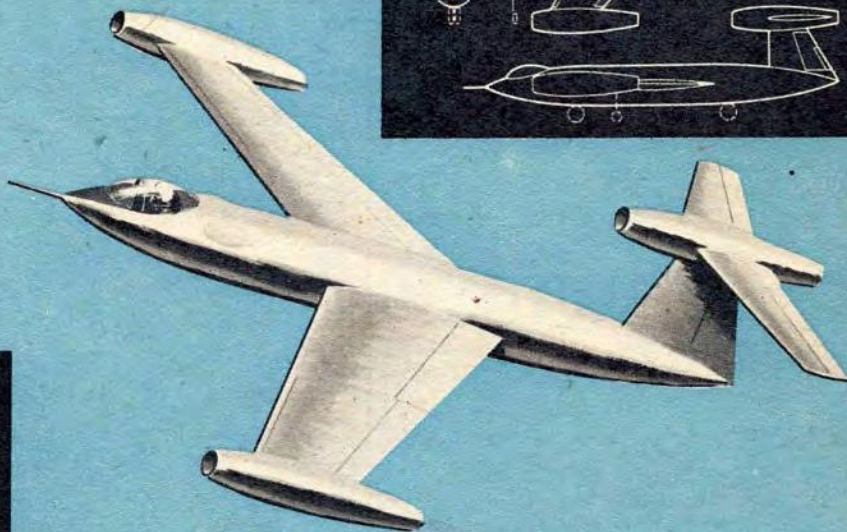
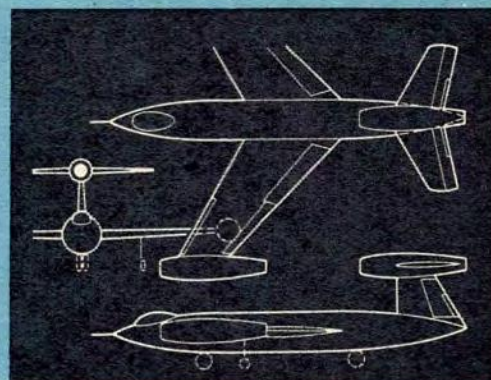
ALFRED  
SWILES



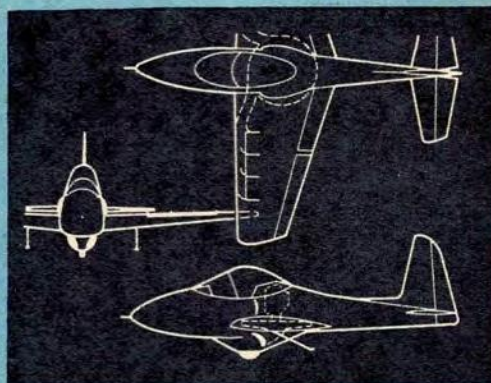
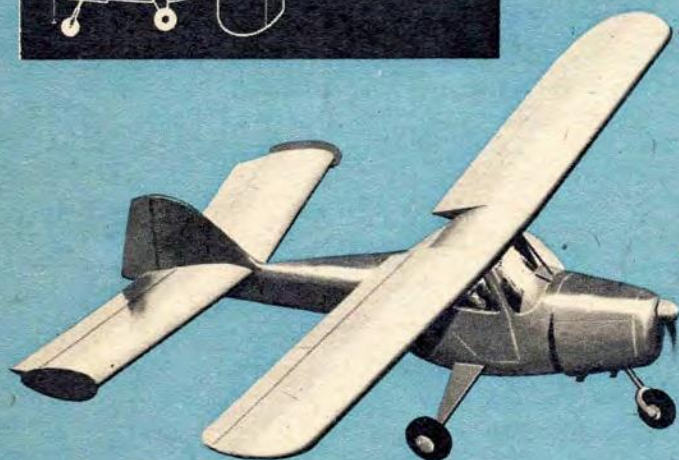
# Airmen of Vision

## DESIGN COMPETITION

Best design of the month, a three-jet fighter-bomber by Lt. Roberto Sanchez Davalos of Mexico City, Mexico. Plane features swept-forward wing with a bi-convex airfoil, slats and spoilers. Interesting is location of the third jet, high on vertical fin. May present structural problems. Span 50 ft., length 61 ft. Engines develop 5000 lbs. thrust each. Top speed 650 mph. Heavy armament in nose.



Tandem wing lightplane by S. Slangsrall of Strommer, Norway. Main wing has an area of 73.5 sq. ft., rear wing 46.5 sq. ft. This type of design gives good stability, slow stalling speed. Quite similar to the French Taupin lightplane of 1937. Powered by a 40 to 50 hp engine, it has a top speed of over 100 mph and lands at 28 mph.



Boundary layer control glider by S. O. Rider of Stockholm, Sweden. Boundary layer is sucked off through slots at leading edge of wing by means of engine-driven pump to rear of pilot's seat. Considerable increase of wing efficiency is obtained through this method, as lift coefficient is doubled. Span 18 ft.; double flap, and aerodynamic fences at slots.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

Judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





# **Embry-Riddle** **MEN OF** **THE HOUR** **are moving UP!**



Thousands of Embry-Riddle trained engineers, mechanics, specialists and pilots are making rapid strides in today's booming aviation industry.

These men in the top jobs are undeniably proving that thorough, practical Embry-Riddle training is by far your quickest, surest road to success in aviation. Complete eight-month to two-year Embry-Riddle courses are tailored to practical aviation industry requirements.

The latest, most modern equipment (including jet engines), the finest instructors, the most complete aviation school campus anywhere, are all yours at Embry-Riddle.

If you are now a high school student, a graduate or a veteran, investigate at once the full advantages and tremendous career security of Embry-Riddle training.

If military service interrupts your studies, you're still a long way ahead of the crowd.

Join the Embry-Riddle Men of the Hour. Write for full information today.

## 4 Keys to Success!

**AIRCRAFT & ENGINE MECHANICS**  
 Our C.A.A.-approved school has a quarter-century aviation training experience. Learn fast with modern equipment, including jet... live aircraft, airline-size hangars.

**A & E COMBINED WITH COMMERCIAL**  
 Embry-Riddle combination training gives you unusual dual pilot-engineering ability.

**AERONAUTICAL DESIGN AND TECHNOLOGY**  
 Embry-Riddle's accelerated 26-mo. Aeronautical Design and Technology Course provides finest training available.

**COMMERCIAL PILOT**  
 Benefit from our experience with 30,000 students...best instructors and aircraft, year-round flying weather.

**Embry-Riddle**  
*International*  
**SCHOOL OF AVIATION**  
 MIAMI 30, FLORIDA

Dean of Enrollments - Dept. 97  
 Embry-Riddle School of Aviation  
 MIAMI 30, FLORIDA  
 Please Print

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

State \_\_\_\_\_ Apt. \_\_\_\_\_

I am interested in...

☐ A.&E. Mechanic

☐ Commercial Pilot

☐ Aeronautical Design and Technology

☐ A.&E. Combined with Commercial Pilot

☐ Flying Mechanic

Check ☐ Veteran ☐ Non-Veteran

TRAIN IN MIAMI--AIR CAPITAL OF THE WORLD



## **Western** **Prowlers**



■ From aircraft plants of the West Coast come these two heavyweight sluggers, the Northrop F-89 Scorpion (above) and the Douglas F3D Skynight (below), Air Force and Navy answers to enemy bombers eager to sneak up on us under the cover of night or bad weather. Both types weigh almost as much as the Douglas DC-3, as they carry

over 1000 lbs. of intricate radar and electronic equipment which helps to ferret out the invisible enemy intruder. The Scorpion is armed with six 20-mm cannons and is equipped with split aileron decelerator air brakes which permit it to descend from 40,000 ft. in a matter of a couple of minutes. The Skynight is a carrier-borne aircraft in the 600 mph class but capable of landing at slow speeds. It also is heavily armed and has a crew escape hatch in the belly of the fuselage. Both planes have two engines and carry a crew of two.

Let enemy visitors beware!

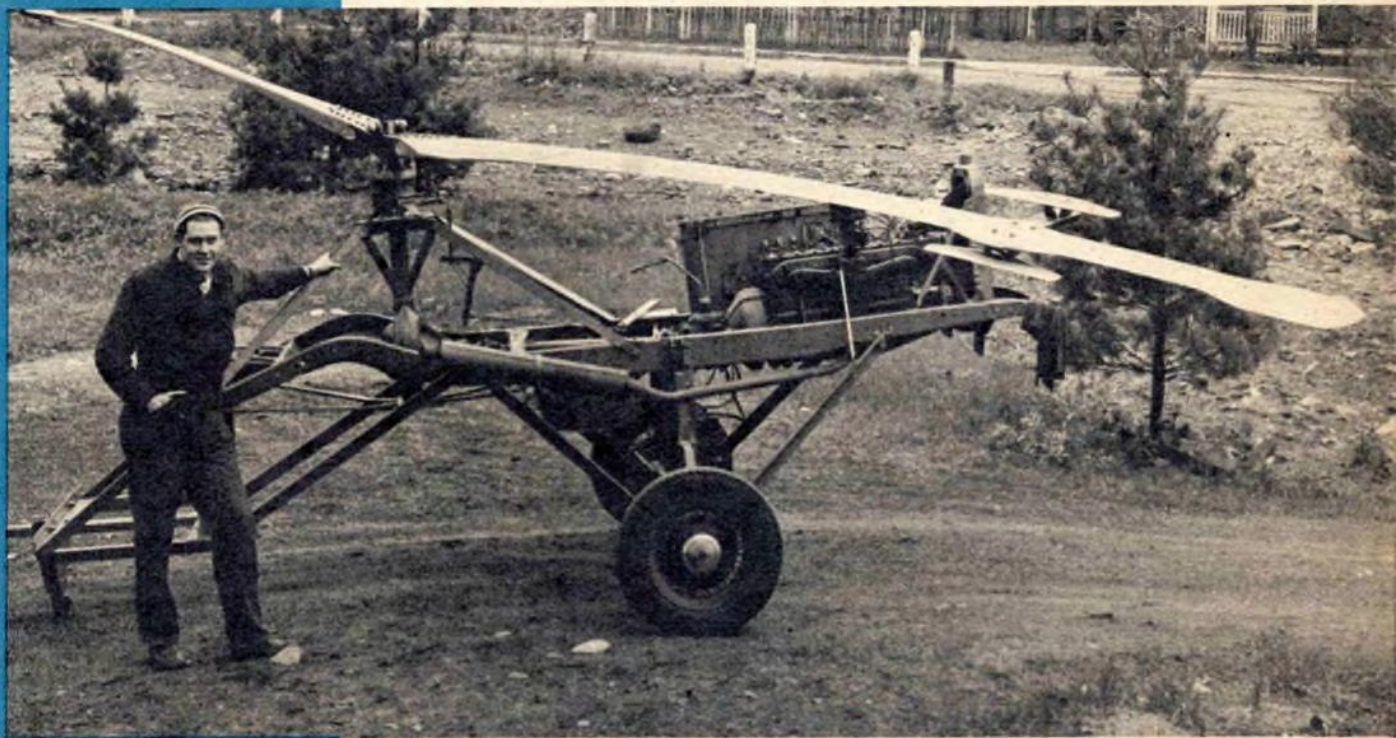






1951 . . . First production of the Kaman HTK-1 for U. S. Navy on maiden flight.

## the Case of Charlie Kaman and his Curious 'Copter



1945 . . . Big (6'6") C. H. Kaman with original ground operated rotor test rig (auto frame).



1946 . . . Charles Kaman (left) chairman of the board and president of the Kaman Aircraft Corp. checks data taken on test rig with Bill Murray, now chief of flight test.

**This ex-modeler turned helicopter manufacturer parlayed a \$50 junk auto into an \$18 million Connecticut aircraft concern**

■ One warm summer day in 1945, 26-year-old Charlie Kaman drove into the automobile graveyard of a Hartford junk dealer, plunked down \$50 and towed away a sad-looking 1933 Pontiac. For the next few weeks the old heap was the center of much activity in the shop of an East Hartford manufacturing concern. A "face lifting" to end all face lifting was underway. When the job was finished the strange contraption was towed to Kaman's mother's home in West Hartford.

Speculation and puzzlement took over the entire neighborhood. What the neighbors saw bore little or no resemblance to an automobile. The chassis had been raised several feet above where Pontiac's engineers intended it to be. Two wheels were missing and the two remaining wheels were located where no self-respecting automobile would ever think of wearing its wheels. The rear end had been rotated 90 degrees so that one rear axle pointed up. The other rear axle was missing. A panel mounting a collection of dials and gauges stood up



## CHARLIE KAMAN AND HIS CURIOUS 'COPTER

alongside the engine. There was a weird assortment of steel braces here and there, a tow bar protruded from one end, a small third wheel was stuck underneath, and the gas tank had decided to move up closer to the engine.

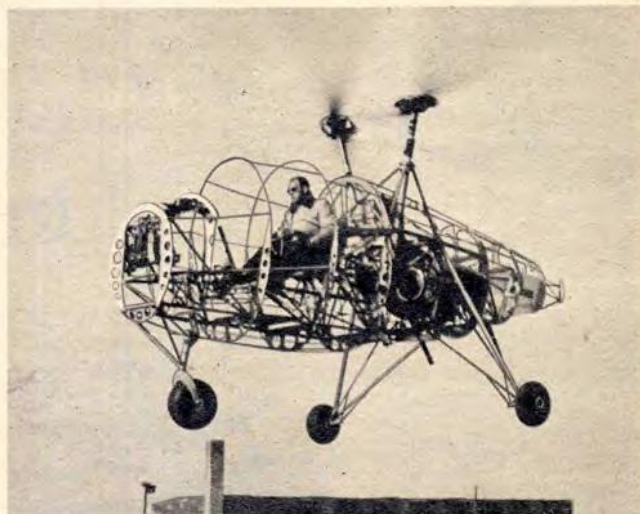
Many of Mrs. Kaman's neighbors had heard of her son's idea for a new kind of flying machine. Some of them, then and there, decided that: 1) the "thing" never would fly and, 2) Charlie Kaman's aircraft company probably wouldn't amount to very much. They were 50% right. The "thing" never would fly. It was designed and built to stay on terra firma like any other dignified automobile. It was, however, the first concrete evidence that Kaman's ideas on a new approach to solving certain helicopter design problems were being pursued with vigor. The "thing" was the ground-operated test rig on which full-scale rotors could be tested and valuable research and development data recorded.

Looking back a few more years to 1940, when members of the graduating class at Catholic University in Washington, D. C., lined up to receive their degrees, Charles H. Kaman, former record-holding model plane builder, was there to be presented a Magna Cum Laude in aeronautical engineering with the highest grades in the Engineering Department. Almost before the caps and gowns had been packed away to await the next year's graduates, Kaman turned up in the aerodynamics section of Hamilton Standard Propellers' Engineering Department. From then until the summer of 1945, when he left the East Hartford propeller concern, engineer Kaman applied his training to propeller and rotor aerodynamics. In doing so, he conceived his ideas on a way to simplify the helicopter's complex rotor control system. Those ideas evolved into the "servo-flap" rotor control which later resulted in the first fully servo-controlled helicopter to receive CAA certification and to go into production for commercial and military uses.

In the early days of Kaman Aircraft the cellar and garage of the Kaman residence were utilized for engineering and workshop. Friends and relatives became interested to the extent of helping financially through purchases of stock in the new company. Other friends, who were in the aeronautical engineering business, worked nights and weekends at Kaman's residence and took stock as pay for their services. Kaman's wife Helen, who had also done engineering work at Hamilton, left her drafting board only when it looked as though coffee and sandwiches were needed to keep the gang going.

With limited working capital, progress was slow at first. However, by mid-1946, enough engineering had been accomplished to prove that the "servo-flap" control was not only practical but that it had certain definite advantages. With this proof in hand, Kaman received financial support from New Enterprises Incorporated of Boston, and from an increasing number of individual investors. As the financial status of the company improved, the speed of the helicopter development increased. In January 1947, the experimental machine—the K-125—made its initial flight from Bradley Field, where the company had moved into larger quarters.

The first tangible evidence of the Navy Bureau of



In 1947 the original Kaman helicopter made its first flight. Unusual were the twin intermeshing rotors and "servo-flap" control system, features of all Kaman designed helicopters. Note absence of tail rotor.



The partially completed K-125 with Charlie at the controls. Ship now had its NX license, Navy became interested in design and awarded the struggling concern a small engineering development contract in 1947.

Aeronautics' interest in Kaman came in May 1947, in the form of a small engineering development contract. This was followed by another Navy engineering contract early in 1948. At the same time, possible commercial applications of rotary wing aircraft were explored and, in April 1949, the K-190 utility helicopter was certified by the CAA for commercial uses. A short time later an improved model, the K-225, received its CAA approval. The same summer Kaman helicopters were doing agricultural dusting and spraying in Connecticut, New York, Maine, North Carolina, and Florida.

Meanwhile the Navy's interest in the Kaman design continued via additional contracts. Early in 1950, two K-225's were delivered to the Navy and one K-225 went to the Coast Guard. The K-225's were purchased for evaluation testing by those services. Largely as a





Kaman K-225 spreading DDT over potato field near Syracuse, N. Y. K-225's have been sold to Navy, Coast Guard, Turkey, State of Miss.

result of the Navy's evaluation tests of the K-225, the company received its first big Navy production contract for HOK-1 helicopters in June 1950 prior to the start of the Korean war. This was followed in September by a production order for HTK-1 Navy trainer helicopters. The first HTK was rolled out and flown to Anacostia Naval Air Station, Washington, in April of this year.

In June 1950 Kaman employees totaled 23 and the company occupied one building on Bradley Field. Today, with an \$18,000,000 backlog of Navy orders, the company occupies eighteen buildings on Bradley, plus 8000 square feet of engineering offices in Hartford and has 540 employees. Expansion of facilities is continuing and it is anticipated that the start of production of HOK's will see a substantial increase in personnel. KAC can be proud of its accomplishments.



Bill Murray, chief of flight test, at controls of K-125 in 1948. Ship had twin rudders added by then. Kaman concern now has Navy contract to investigate application of Boeing 502-2 gas turbine in a 'copter.



Man-Monitored  
**MISSILE**







■ At a Black Sea station, say reports, the Russians continue the Nazi anti-aircraft scheme of a monitored man-ridden guided missile.

The German missile design was a cruciform wing and tailed supersonic affair monitored to the target by a pilot in a flying wedge aircraft carrying a radar-guide beam. While attached to the missile the control system of the wedge is electrically responsive to that of the missile, so that during the first part of the flight the monitor plane pilot flies both the missile and monitor aircraft.

The whole unit is launched at a very high angle—between 75 and 80 degrees. Until the pilot recovers from the jar of being launched, the unit is directed toward the target by ground radar. Then the human pilot takes over as the plane-and-missile reaches the general vicinity of an approaching enemy bomber formation.

The pilot-plane detaches from the missile, then directs the big machine into the bomber formation with its radar beam. Later, for a skid landing, the pilot plane drops major part of lower rudder.

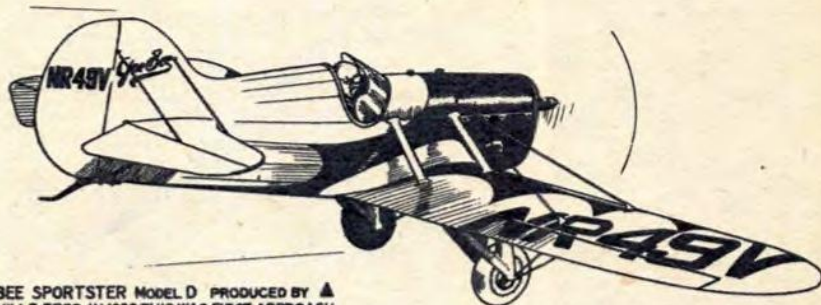


# AIR PROGRESS

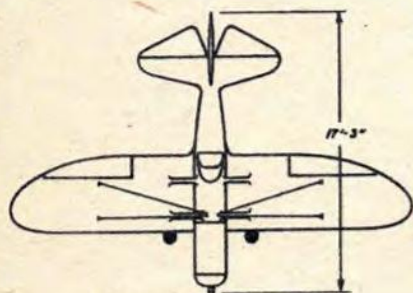
By DOUGLAS ROLFE

## THE GEE BEE STORY

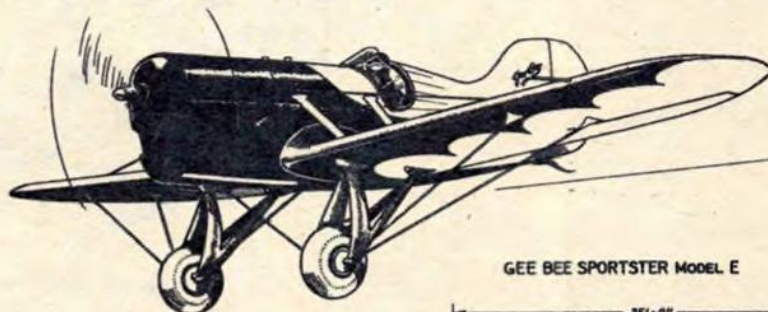
Most fabulous racers of all time... the record-breaking, trophy-winning "flying milkbottles"



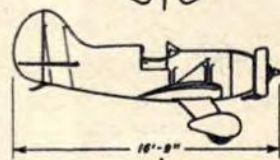
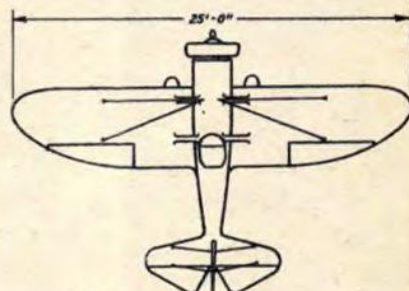
GEE BEE SPORTSTER MODEL D PRODUCED BY ▲ GRANVILLE BROS. IN 1930 THIS WAS FIRST APPROACH TO THE FAMED GEE BEE RACERS. THE SEMI-CANTILEVER ◀ WINGS WERE EXTERNALLY BRACED AS SHOWN WITH STREAMLINE STEEL WIRE. VARIOUSLY POWERED WITH 85 AND 125 H.P. MENASCO OR 110 H.P. CIRRUS ENGINES IT HAD A TOP SPEED OF 159 M.P.H. WITH 125 H.P. ENGINE ▼



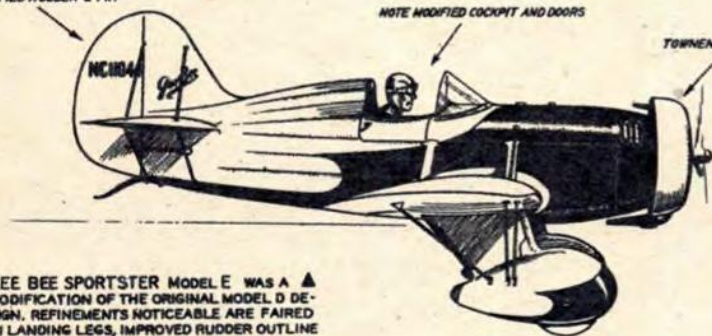
GEE BEE SPORTSTER D



GEE BEE SPORTSTER MODEL E



NOTE MODIFIED RUDDER & FIN

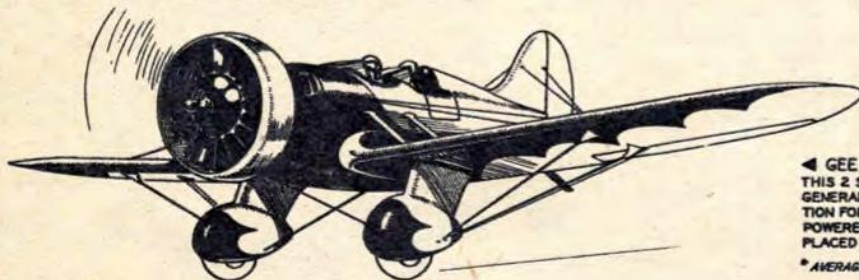


NOTE MODIFIED COCKPIT AND DOORS

TOWNSEND DRAG RING

GEE BEE SPORTSTER MODEL E WAS A ▲ MODIFICATION OF THE ORIGINAL MODEL D DESIGN. REFINEMENTS NOTICEABLE ARE FAIRER IN LANDING LEGS, IMPROVED RUDDER OUTLINE AND CLOSED-IN COCKPIT. WITH 110 H.P. WARNER SCARAB RADIAL ENGINE TOP SPEED WAS 148 M.P.H.

DOUGLAS ROLFE



◀ GEE BEE SENIOR SPORTSTER MODEL YL THIS 2 SEAT MODIFICATION OF THE MODEL E IS GENERALLY REGARDED TODAY AS THE INSPIRATION FOR THE MODEL Z RACER. A SINGLE SEAT Y, POWERED WITH A 300 H.P. P&W WASP "C" ENGINE PLACED 4TH IN 1931 THOMPSON TROPHY RACES\*

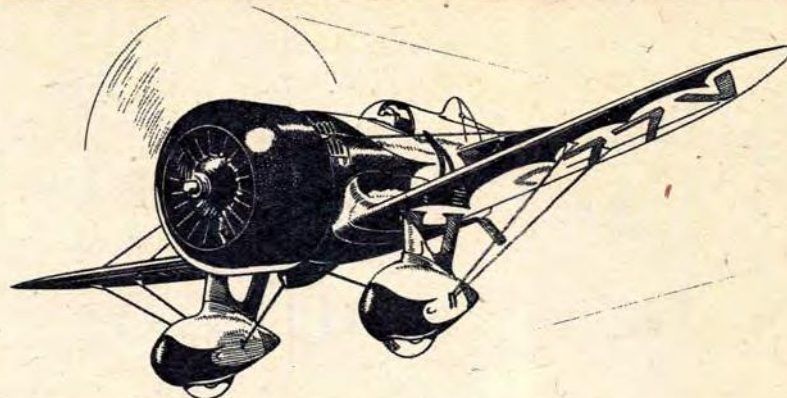
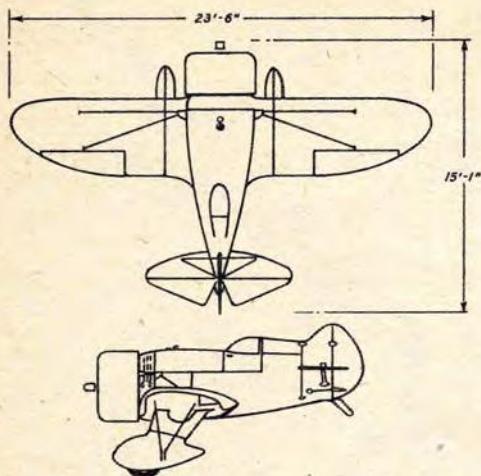
\* AVERAGE SPEED 201.250 M.P.H.

In the early 1930's the most exciting racing airplanes in the world were the stubby, speedy little Gee Bee Racers which flashed briefly across the aviation scene and then passed into obscurity. During their short reign they managed to win the coveted Thompson Trophy for two successive

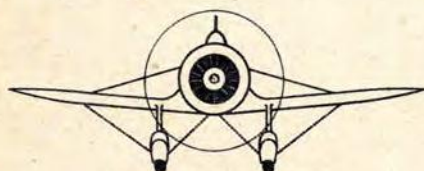
years and hung up an unofficial world's speed record for land-planes. The general history of these externally braced, low-wing monoplanes is traced by the illustrations above.

The name "Gee Bee" was derived from the name of the original company, Granville Brothers, which set up business in

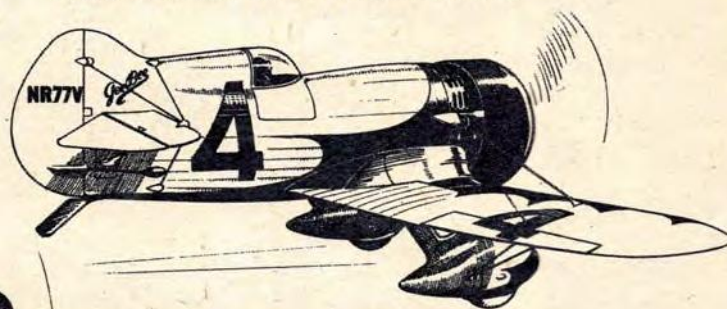




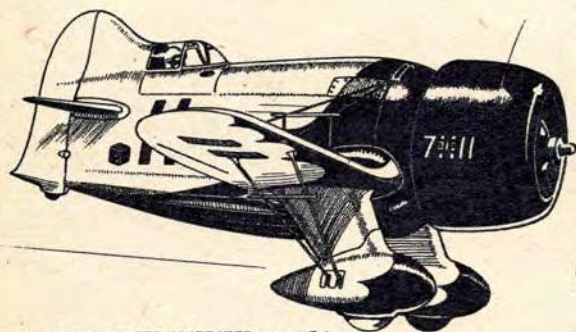
▲ GEE BEE SUPER-SPORTSTER MODEL Z, FIRST OF THE FAMED GEE BEE HIGH SPEED MONOPLANES AND WINNER OF THE 1931 THOMPSON TROPHY RACES\*—IN NOVEMBER 1931 THE SAME MACHINE EXCEEDED THE EXISTING WORLD'S SPEED RECORD FOR LANDPLANES. IN A FURTHER ATTEMPT TO ESTABLISH A NEW AND OFFICIAL† RECORD IT CRASHED, KILLING THE WELL-KNOWN PILOT LOWELL BAYLES. ENGINE WAS A 535 H.P. P & W WASP JUNIOR ▼



GEE BEE SUPER-SPORTSTER Z

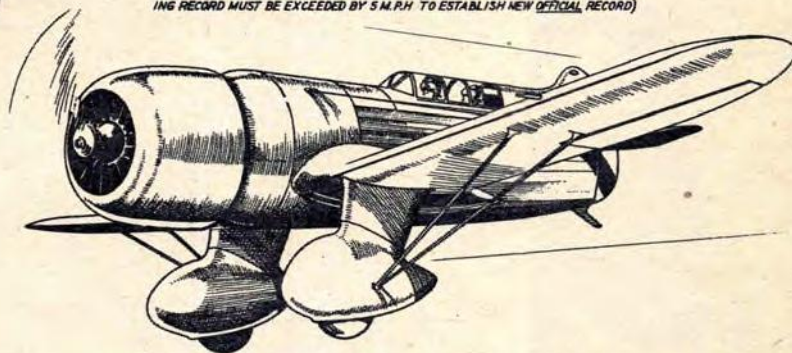


\* AVERAGE SPEED: 236 M.P.H.—PILOT: LOWELL BAYLES  
† EXISTING RECORD: 278.3 M.P.H. BAYLES'S SPEED: 281.5 M.P.H. (BUT STANDING RECORD MUST BE EXCEEDED BY 5 M.P.H. TO ESTABLISH NEW OFFICIAL RECORD)

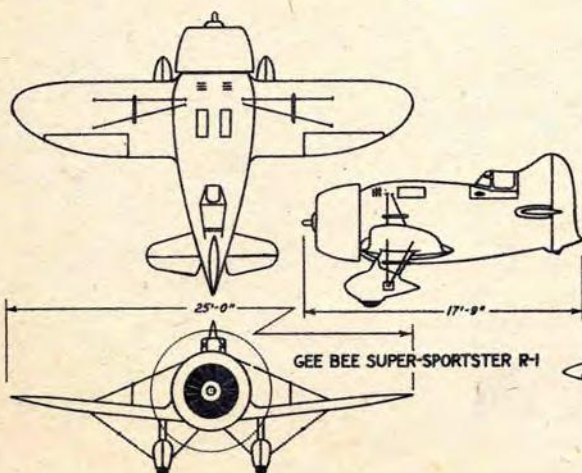


▲ GEE BEE SUPER SPORTSTER MODEL R-1 WINNER OF THE 1932 THOMPSON TROPHY RACES IT WAS POWERED WITH AN 800 H.P. P & W HORNET RADIAL ENGINE\* A SISTER SHIP WAS FITTED WITH THE 535 H.P. WASP ▼

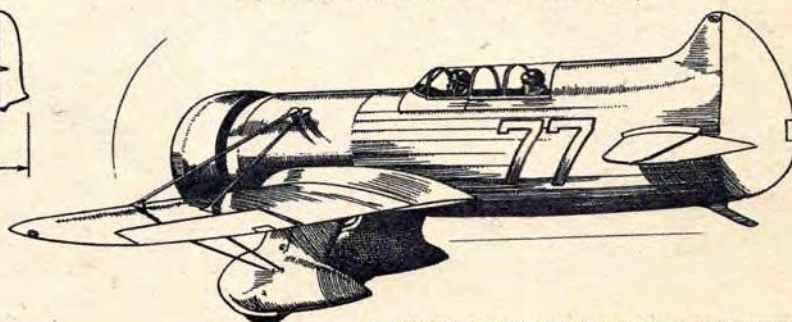
\* AVERAGE SPEED: 252 M.P.H. PILOT: JAS. DOOLITTLE



▲ LARGEST AND LAST GEE BEE RACER THE R-6 (OR "Q.E.D.") WAS BUILT FOR JACQUELINE COCHRAN TO COMPETE IN THE MACROBERTSON RACE\* IT WAS ALSO FLOWN IN THE 1934 BENDIX TROPHY RACES.—WINGSPAN WAS 33 FT. 3 IN., ENGINE A 700 H.P. PRATT & WHITNEY HORNET S5-E ▼



GEE BEE SUPER-SPORTSTER R-1



\* THE MACROBERTSON RACE (LONDON, ENGLAND, TO AUSTRALIA) TOOK PLACE IN 1934—WAS WON BY THE SENSATIONAL DE HAVILLAND COMET

Springfield, Mass., in 1930. In 1933 the firm became the Granville Airplane Company and about 1934 this was changed to Granville, Miller and DeLackner. The latter company produced the model "Q.E.D.", expressly designed for Jacqueline Cochran (now Mrs. Floyd Odlum) for the MacRobertson

race in 1934. (The race from England to Australia.)

Although the Gee Bees first attracted attention in the 1931 Thompson Trophy Races, they had in fact proved to be more than ordinarily fast airplanes from the very start. The three-view drawings shown here are substantially correct.



# AIR TRAILS<sup>®</sup>

NOVEMBER 1951  
25 CENTS



Bevo Howard's  
BUECKER JUNGMEISTER



Caro Bayley's  
PITTS SPECIAL



Kip Mone's  
NIEUPORT



Betty Skelton's  
PITTS SPECIAL



Marion Cole's  
WASP STEARMAN



Nat'l Air Show's  
CURTISS JUNIOR



Rod Jocelyn's  
GREAT LAKES SPECIAL

S. CALHOUN SMITH

Fighters In Miniature:  
**ARMED AIR GNATS**



# THE ATOM from DESTRUCTION to PROPULSION!



Nuclear fission . . . splitting the atom to release an almost unlimited destructive force — a force that men plan to harness to drive trains, ships, and airplanes.

Locked in only one pound of the fissionable material U-235 is energy to equal 6 million gallons of airplane gasoline! It's no wonder engineers are planning to propel planes with atomic power . . . the most concentrated source of energy yet discovered by man.

But an atomic powerplant emits deadly radiation. The tons of shielding necessary for protecting men and instruments would be more than any existing plane could carry. A sky giant must be created . . . an airplane that will dwarf anything in the sky today.

What does the atom-powered plane mean to you! If you are interested in aviation, it means this. The aviation industry progresses rapidly. New designs, powerplants, operating procedures . . . every field of aviation demands men who have the schooling, creative ability, and foresight that will enable them — not only to keep pace with aviation — but to lead it. The courses at PARKS COLLEGE are planned to give you this ability.

At PARKS you will receive a Bachelor of Science in Aeronautics Degree from Saint Louis University — the first university west of the Mississippi. In the 400-year old tradition of Jesuit schools, PARKS teaches you not only how to make a living, but also how to live.

**ENTRANCE REQUIREMENTS** . . . Applicants must be graduates from a 4-year high school, of good moral character and demonstrated ability. Next Parks enrollment dates — January 4-5 — Winter Semester.

## AIR FORCE ROTC

Complete your schooling — without interruption — and receive a commission as a Second Lieutenant in the United States Air Force Reserve.

MAIL THIS COUPON *today*

## PARKS COLLEGE OF ST. LOUIS UNIVERSITY



2111 CAHOKIA ROAD

EAST ST. LOUIS, ILL.

PARKS COLLEGE OF SAINT LOUIS UNIVERSITY  
2111 Cahokia Road, East Saint Louis, Illinois

I am interested in:

- ☐ Air Transportation ☐ Aeronautical Engineering  
☐ Aircraft Maintenance Engineering

Name..... Age.....

Address..... Zone.....

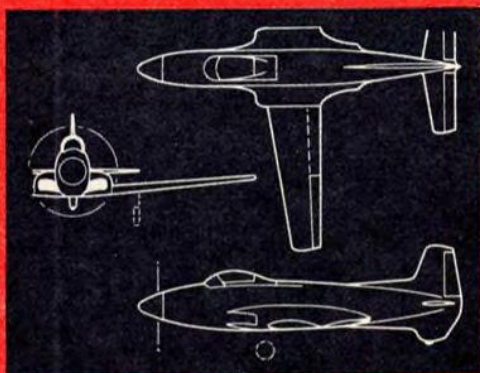
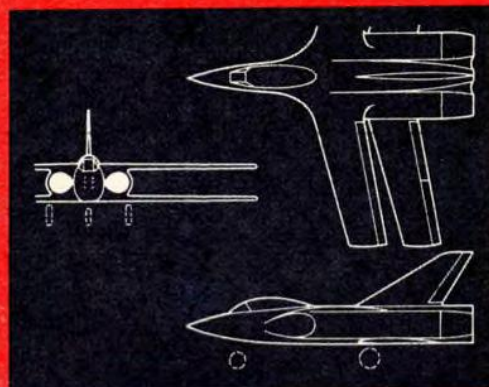
City..... State.....



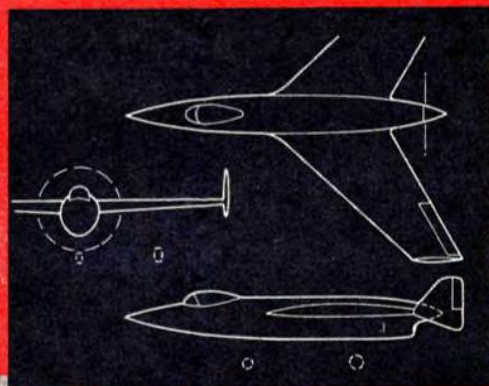
# Airmen of Vision

## DESIGN COMPETITION

Selected as best design of month, this carrier-based fighter by Joe Kemphe of Downey, Ill., follows general shape of Delanne design. Power is supplied by two turbo-jets of 2,000 lbs. thrust each. Also, four solid fuel rockets in tail with total thrust of 40,000 lbs. give additional boost for take-off climb and getaway. Top speed 700 mph.



Racing plane designed to proposed 500 cu. in. displacement for civilian Thompson Trophy race by James D. Stewart, Danville, Ill. 185 hp engine behind pilot drives prop through extension shaft. Air scoops in center provide cooling. Max. speed 300 mph. Span 29 ft. Construction all metal.



A small cargo and shuttle plane by Jerry C. Russell, Hawthorne, Cal. Cargo storage in fuselage at wing root section. Landing is tri-cycle, main gear retracting into wing. Small turbo-prop similar to the Boeing 502, developing 170 hp. Sharply swept-back wings have span of 31 ft. 9 in.; fuselage length 34 ft. Top speed of 190 mph.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 43rd St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



# Fighters in Miniature: ARMED AIR GNATS

By R. G. NAUGLE



**A new front-line weapon—service lightplanes that bristle with guns, rockets and bombs**

■ The Ground Forces want their own Air Force. That, in a nutshell, is what the Army thinks of airpower as applied to the tactical trick of hitting the enemy just a few yards over the front lines. They want their *own* airplanes, flown by their *own* pilots to attack the enemy from the air. They want to do this without the aid of the Air Force. They're tired of their small unarmed liaison planes. They want gun-toting fighting flivver planes of the air!

The Army and the Air Force have wrangled over this for some time. When the combat forces of the United States were "unified"—that is, separated after World War II, with the Air Force breaking loose from the Army—the Air Force insisted that they and they alone had the right to buy and fly all aircraft over 2,500 lbs. empty,





In panel below across these two pages are shown possibilities for arming various service lightplanes, with two of them now actually so equipped: the Temco T-35 and the Fletcher Defender, first and last planes on next page.

FRANK TINSLEY



#### MOONEY MITE

Two cal. .30 machine guns  
in wings.  
Can be equipped with rockets



#### CESSNA LC-126

Two cal. .30 machine guns.  
Rocket mounts  
under wings.



#### TWIN BONANZA

Two cal. .30 machine guns.  
Rocket mounts  
under wings.

and all armed aircraft regardless of weight. This immediately limited the Army to small Cub-like liaison planes like the Aeronca L-16, Navion L-17, Cessna L-19 and Piper L-21, with the pilot "armed" with a .45-caliber automatic slung under his shoulder for protection if forced down.

The Ground Forces had to go along with this set-up. They had no choice. They bought their liaison planes with their own dollars (but through the Procurement Division of the Air Force), flew them themselves—and hoped for a break in the future. Since there wasn't much money available during the postwar Johnson economy era, they couldn't afford large aircraft anyway. When the Korean War broke out, however, and their own boys were again ducking shells, they kicked over the traces and insisted on both larger and armed planes capable of dealing deathblows to the enemy when and where he was found without calling in the Air Force for help.

While spotter planes of World War II made a practice of staying over friendly territory, in Korea, "Mosquitoes" — war-weary T-6 Texan trainers — ranged far over enemy lines directing jet and piston-

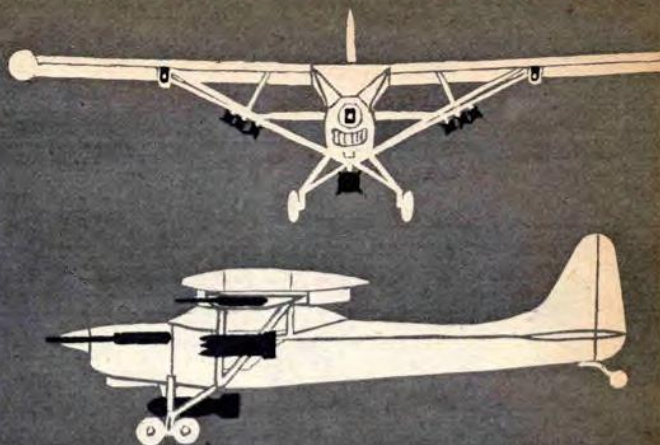
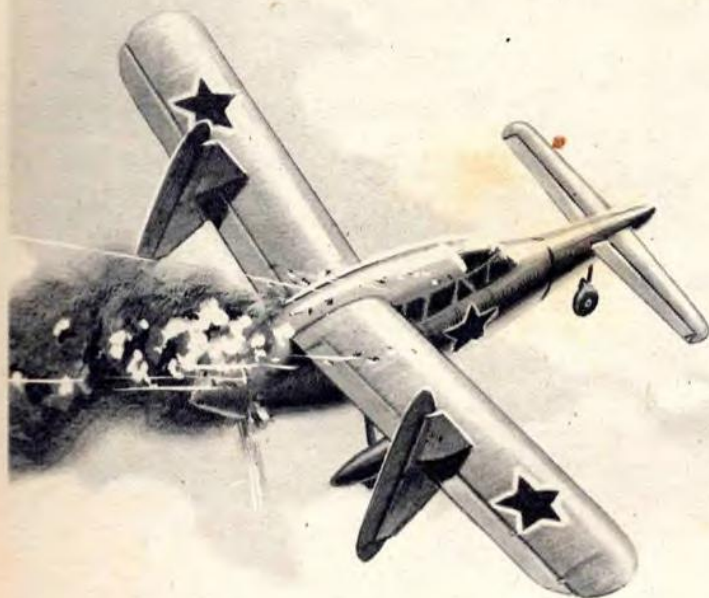
driven fighter attacks on tanks, artillery pieces, supply dumps, troop concentrations and other targets. The unarmed T-6's bird-dogged Air Force F-80's, F-84's, F-51's and B-26's—or Navy Douglas Skyraiders and F4U Corsairs—on to the targets.

All this takes a time-consuming and complicated air-ground communication system to coordinate the attack. The Ground Forces insist that nine times out of ten it can be done with small armed liaison-type craft equipped with light machine guns, rockets, fragmentation and anti-personnel bombs and Napalm bombs based right behind the front lines and ready to go minutes after the word is given.

Napalm is an especially potent weapon in such cases. This fantastically fiery stuff made of jellied gasoline splashes a scorching, roasting 1500 deg. F. inferno among trees, gun positions and dug-in personnel, burning everything within a hundred-yard radius. It splashes and sticks to everything it touches—and small planes, they insist, can carry the stuff. Bombs composed of this strawberry-colored material can be made up in the field by G.I.'s mixing the magic Napalm powder (sodium palmitate) into ordinary avia-



Modern "Maytag Messerschmitt," unlike WW II predecessor, will have teeth to fight back. Here a Beechcraft Mentor armed with cal. .30 m.g.'s is depicted destroying a Red MiG Utka liaison plane bent on artillery spotting and recon.



Artist's conception of a "fighting flivver" incorporating basic characteristics of Helioplane: high-angle take-off, slow landing speed, flying safety. All parts standardized for "cannibalization." Dual wheels and self-sealing tires for rough-terrain landing. Armament: two cal. .30 demountable 'package m.g.'s, one cal. .50 firing through hub (possible with engine mounted a la Helioplane, where power to prop is delivered through series of belts from engine mounted below prop shaft). Rockets mounted on V-struts; Napalm bomb carried below fuselage. Armor around engine and cockpit as feasible.



#### TEMCO T-35

Two cal. .30 machine guns in wings.  
Ten rockets under wings.



#### AERO-COMMANDER

Two cal. .30 machine guns in nose.  
Rockets under wings.



#### FLETCHER DEFENDER

Two cal. .30 machine guns.  
Four 5" HVAR rockets under wings.

tion gasoline and funneling it into any handy container.

A small air-driven windmilling fuse arms the bomb as it drops. Its psychological effect alone is tremendous. Truly a fearsome weapon and ideal for small front-line planes able to slip over the lines undetected until the canned hell tumbles down from the skies.

Rockets are a natural for small planes. They're recoil-less (as different from a chattering machine gun which must be solidly mounted to prevent structural damage), they carry a terrific punch and are relatively light in weight. With shaped charges, terrific penetrating power is packed into a relatively small projectile able to knock out tanks and armored vehicles. Rockets on lightplanes aren't new. They were tried experimentally not only during World War II but even in the first World War.

In Italy, during World War II, mechanics at several of the liaison bases rigged up brackets for attaching Bazooka-type rockets to the lift struts of Cubs and L-5's—just to see what would happen. They worked O.K. even with the crude fittings with which they were tried. . . .

But any armed airplane will be an Air Force airplane, said the high brass, and that was that.

A few months ago "unofficial" tests were carried out by the Army at Ft. Sill, Oklahoma, with an L-5 bearing .30-caliber guns and 100 lb. bombs. The results were of such a nature that Ground Force high brass smiled and said go ahead.

Perhaps another reason was reports on Russia's three-place, 110 hp, MiG-8 Utka (Duck)—a small Canard or "tail-first" liaison plane with pusher propeller and with the horizontal tail attached to the nose of the fuselage. The wings can be removed and the stubby fuselage used as a snow sled or ground vehicle able to reconnoiter by itself. The Utka is believed to carry small caliber guns and light armor. The Russians seem to be unimpressed with traditional air tactics and are willing to push the small plane to its ultimate capability. The Army wants to do that right now.

Rockets and fire bombs are far more powerful than the solid projectile machine gun bullets and fragmentation bombs of the last war. They weigh much less and therefore can be carried by much smaller airplanes. For example, the (Continued on page 69)



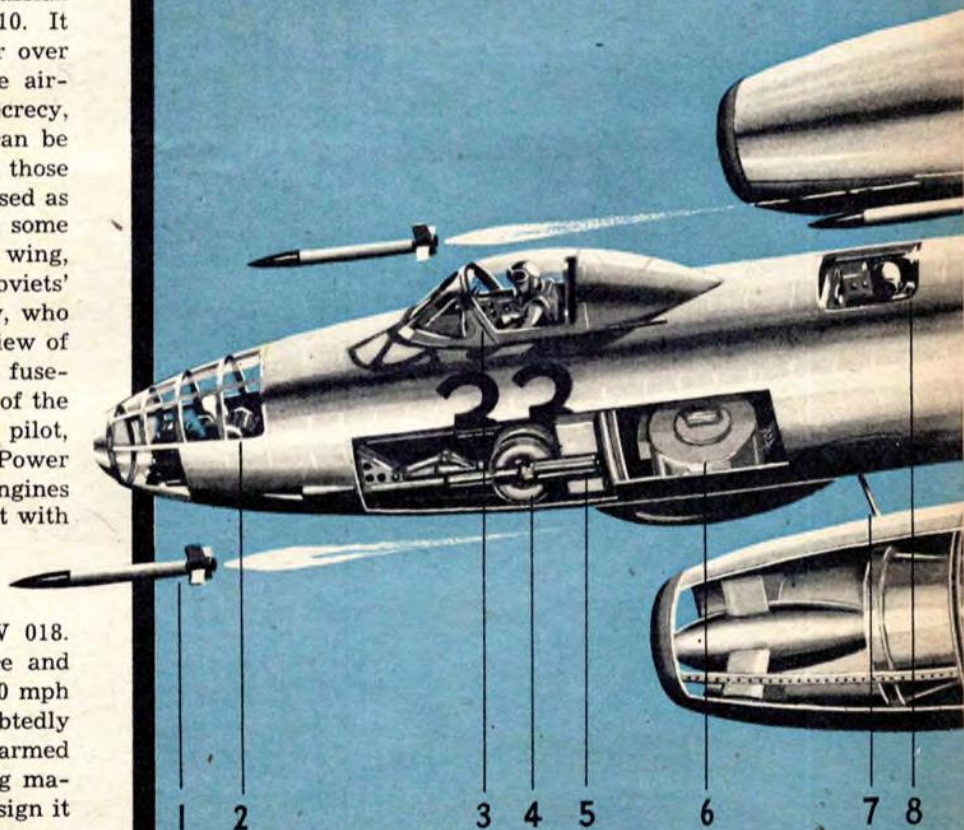
Gospodin Zhigarev's

# Tu-10 ATTACK BOMBER

**The most comprehensive inside view yet of Russia's latest known tactical bomber—a potential "atomic age Stormovik"**

■ The latest known addition acquired by Chief Air Marshal Zhigarev for the Russian air force is the tactical bomber Tu-10. It made its appearance earlier this year over East Berlin. As usual, details of the aircraft are shrouded in Iron Curtain secrecy, but what has leaked out and what can be gleaned from pictures and reports of those who saw the plane fly, it can be assessed as a pretty effective weapon. Spanning some 70 feet from tip to tip of its tapered wing, the Tu-10 is the brainchild of the Soviets' premier designer, Andrei N. Toupolev, who no doubt had more than one casual view of the German Arado 234. The 60-foot fuselage carries a crew of four consisting of the bombardier in the glassed-in nose, pilot, radio-radar operator and tail gunner. Power is supplied by two large M-018 jet engines said to develop over 7500 lbs. of thrust with after-burners. The engines were developed by Russia's outstanding engine expert, A. D. Shvetsov, it is suspected, from the German BMW 018. Judging from the general appearance and power, the Tu-10 should be in the 600 mph class. Its tactical employ will undoubtedly be support of ground troops. As it is armed with rockets as well as forward-firing machine guns, the Russians may even assign it "Stormovik" duties, as a tank destroyer. Large effective flaps reduce considerably the stalling speed, giving the plane quick take-off characteristics and low landing speed, suitable for close-to-front-line operation, an important factor for tactical planes. Known to exist also is a training version of the Tu-10 with solid nose and less powerful engines. The Tu-10 is a formidable airplane and a feather in Gospodin (Mr.) Zhigarev's hat.

And considering the possibility that the bomber's general design as well as its jet engines may not be wholly original with the Russians, that feather may have been plucked directly from the famous Tyrolean headgear of Herr (Mr.) Goering.







1. Air to ground rockets (5" cal. ?)
2. Bomb aimer in Plexiglass nose section.
3. Pilot's cockpit. Armor glass windshield and back armor.
4. Full-swivelling twin-nosewheels retract backwards.
5. One fixed forward-firing heavy caliber cannon (30-37-mm) each side of nose.
6. Radar. (Search, bombing & gun triggering?)
7. Radio antenna.
8. Radio and radar operator.
9. Main undercarriage wheels retract forwards turning through 90° to lie flat in bottom of nacelle.

10. Axial-flow type jet engine with provision for after-burning.
11. Bomb-bay with provision for mixed loads.
12. Rockets carried in racks under wing center-section.
13. Droop-type flaps give comparatively slow landing speed.
14. Large tail bumper fairing.
15. Rear gunner's turret with twin 20-mm or 23-mm cannon in ball type mounting.
16. Swept-back empennage.
17. Main fuel tanks in fuselage mid-section.
18. Three-quarter-span built-in self-sealing fuel tanks.

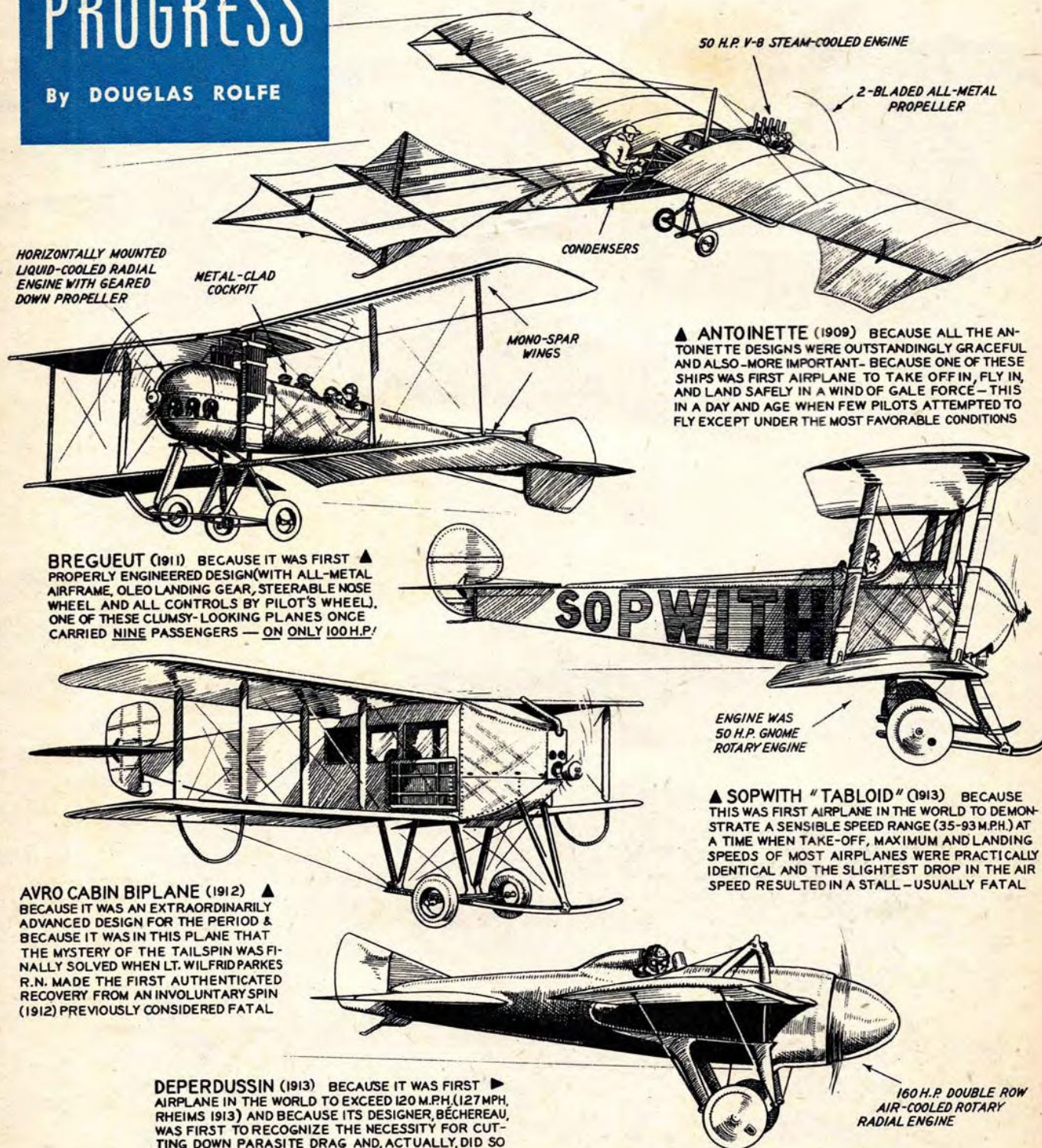
*Delancey*



# AIR PROGRESS

By DOUGLAS ROLFE

## MY FAVORITE "TEN"



50 H.P. V-8 STEAM-COOLED ENGINE

2-BLADED ALL-METAL PROPELLER

HORIZONTALLY MOUNTED LIQUID-COOLED RADIAL ENGINE WITH GEARED DOWN PROPELLER

METAL-CLAD COCKPIT

CONDENSERS

MONO-SPAR WINGS

▲ ANTOINETTE (1909) BECAUSE ALL THE ANTOINETTE DESIGNS WERE OUTSTANDINGLY GRACEFUL AND ALSO—MORE IMPORTANT—BECAUSE ONE OF THESE SHIPS WAS FIRST AIRPLANE TO TAKE OFF IN, FLY IN, AND LAND SAFELY IN A WIND OF GALE FORCE—THIS IN A DAY AND AGE WHEN FEW PILOTS ATTEMPTED TO FLY EXCEPT UNDER THE MOST FAVORABLE CONDITIONS

BREGUET (1911) BECAUSE IT WAS FIRST ▲ PROPERLY ENGINEERED DESIGN (WITH ALL-METAL AIRFRAME, OLEO LANDING GEAR, STEERABLE NOSE WHEEL AND ALL CONTROLS BY PILOT'S WHEEL). ONE OF THESE CLUMSY-LOOKING PLANES ONCE CARRIED NINE PASSENGERS — ON ONLY 100 H.P.!

ENGINE WAS 50 H.P. GNOME ROTARY ENGINE

▲ SOPWITH "TABLOID" (1913) BECAUSE THIS WAS FIRST AIRPLANE IN THE WORLD TO DEMONSTRATE A SENSIBLE SPEED RANGE (35-93 M.P.H.) AT A TIME WHEN TAKE-OFF, MAXIMUM AND LANDING SPEEDS OF MOST AIRPLANES WERE PRACTICALLY IDENTICAL AND THE SLIGHTEST DROP IN THE AIR SPEED RESULTED IN A STALL—USUALLY FATAL

AVRO CABIN BIPLANE (1912) ▲ BECAUSE IT WAS AN EXTRAORDINARILY ADVANCED DESIGN FOR THE PERIOD & BECAUSE IT WAS IN THIS PLANE THAT THE MYSTERY OF THE TAILSPIN WAS FINALLY SOLVED WHEN LT. WILFRID PARKES R.N. MADE THE FIRST AUTHENTICATED RECOVERY FROM AN INVOLUNTARY SPIN (1912) PREVIOUSLY CONSIDERED FATAL

DEPERDUSSIN (1913) BECAUSE IT WAS FIRST ▲ AIRPLANE IN THE WORLD TO EXCEED 120 M.P.H. (127 M.P.H. RHEIMS 1913) AND BECAUSE ITS DESIGNER, BÉCHEREAU, WAS FIRST TO RECOGNIZE THE NECESSITY FOR CUTTING DOWN PARASITE DRAG AND, ACTUALLY, DID SO

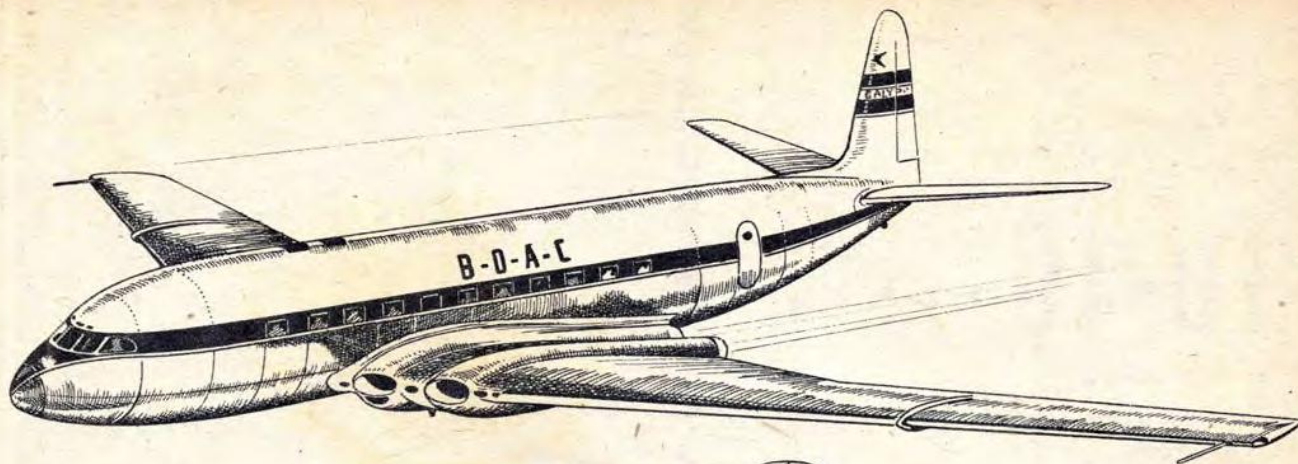
160 H.P. DOUBLE ROW AIR-COOLED ROTARY RADIAL ENGINE

"The Editors of Air Trails have suggested I draw up what I consider my ten favorite airplanes. The assorted collection above appears to me to have contributed in some considerable measure to air progress. All represent original designs—and not thinly disguised imitations of other aircraft. The reason for selecting each is explained. Readers certainly

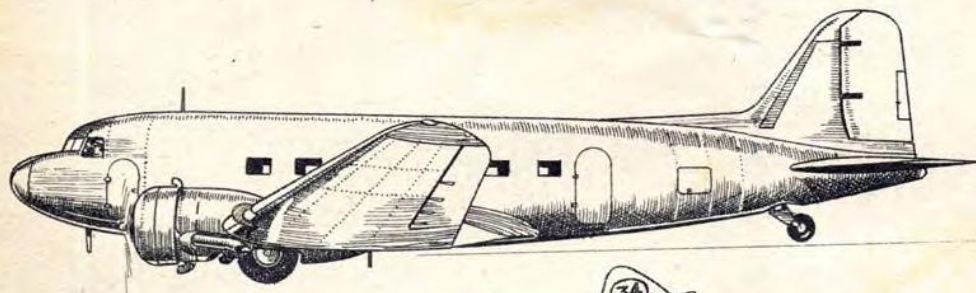
may not agree with the choice: what would you do in making such a selection?—Douglas Rolfe."

Whatever selection you'd make, you'll have to admit that Artist Rolfe has earned the right to say his piece. Born in London, he served with the English forces throughout World War I—his passion for planes resulting in selection as one



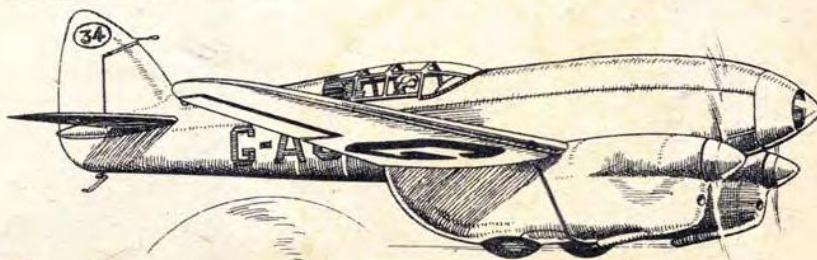


▲ DE HAVILLAND "COMET"  
BECAUSE, AS FIRST JET AIRLINER  
IN THE WORLD TO REACH THE PRO-  
DUCTION STAGE, IT PROMISES TO  
OPEN AN ENTIRELY NEW CHAPTER IN  
THE HISTORY OF AIRLINE TRAVEL &  
BECAUSE IT IS THE PRODUCT OF A  
FIRM WHOSE NAME WAS IDENTIFIED  
WITH FINE AIRCRAFT 38 YEARS AGO



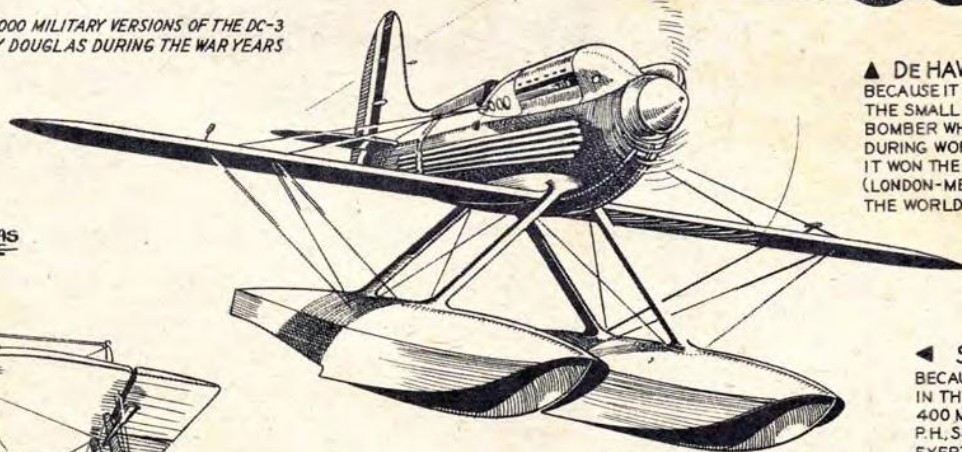
DOUGLAS DC-3 BECAUSE IN PRE-WAR DAYS ▲  
IT WAS RESPONSIBLE FOR 93 PER CENT OF ALL U.S.  
PASSENGER AIRLINE TRAVEL WHILE, DURING THE  
WAR ITSELF, UNDER VARIOUS DESIGNATIONS (C-47,  
DAKOTA ETC.) IT EARNED THE NAME 'WORKHORSE  
OF THE AIR' — TODAY THIS WONDERFUL AERO-  
PLANE IS STILL IN SERVICE ALL OVER THE WORLD

\*MORE THAN 10,000 MILITARY VERSIONS OF THE DC-3  
WERE BUILT BY DOUGLAS DURING THE WAR YEARS

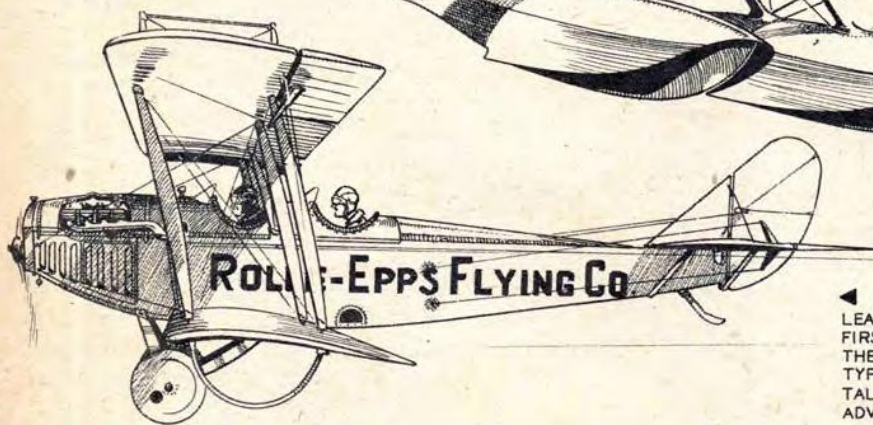


▲ DE HAVILLAND "COMET" (1934)  
BECAUSE IT WAS FIRST APPROACH TO  
THE SMALL FAST TWIN-MOTOR FIGHTER-  
BOMBER WHICH CAME TO THE FORE  
DURING WORLD WAR 2 AND BECAUSE  
IT WON THE MACROBERTSON RACE  
(LONDON-MELBOURNE 1934) AGAINST  
THE WORLD'S BEST PLANES & PILOTS

DOUGLAS  
ROLFE



◀ SUPERMARINE S.6B  
BECAUSE IT WAS FIRST AIRPLANE  
IN THE WORLD TO ARRIVE AT THE  
400 M.P.H. SPEED MARK (407.5 M.  
P.H. SEPT. 1931) AND BECAUSE IT  
EXERTED A PROFOUND INFLUENCE  
ON ALL SUBSEQUENT HIGH SPEED  
PISTON-ENGINE AIRPLANE DESIGN



◀ CURTISS JN-4D BECAUSE MORE U.S. PILOTS  
LEARNED TO FLY, AND MORE U.S. CITIZENS HAD THEIR  
FIRST AIRPLANE RIDE, IN THE OLD "JENNY" DURING  
THE PERIOD 1918-1924 THAN IN ANY OTHER SINGLE  
TYPE OF AEROPLANE — AND FOR PURELY SENTIMENTAL  
REASONS RELATED TO SOME BARNSTORMING  
ADVENTURES WITH THESE CRATES MANY MOONS AGO

of the first candidates for gunner-observer training and de-  
mobilization with rank of 2nd Lieutenant of the R.A.F. Came  
to this country after war and barnstormed in South, but leg  
injury quashed further active flying. Recalling the many  
identification drawings he did for R.A.F., he swung into avia-  
tion art work commercially in 1928. Since then, figures he's

turned out between 20,000 and 30,000 separate plane pic-  
tures. As trim, ruddy and 6-foot-plus as when he inked his  
first Air Progress for us long before World War II, Doug  
still jumps to the window in his Connecticut studio at the  
sound of a flying machine overhead. Good habit!

—The Editors.



# Development.....

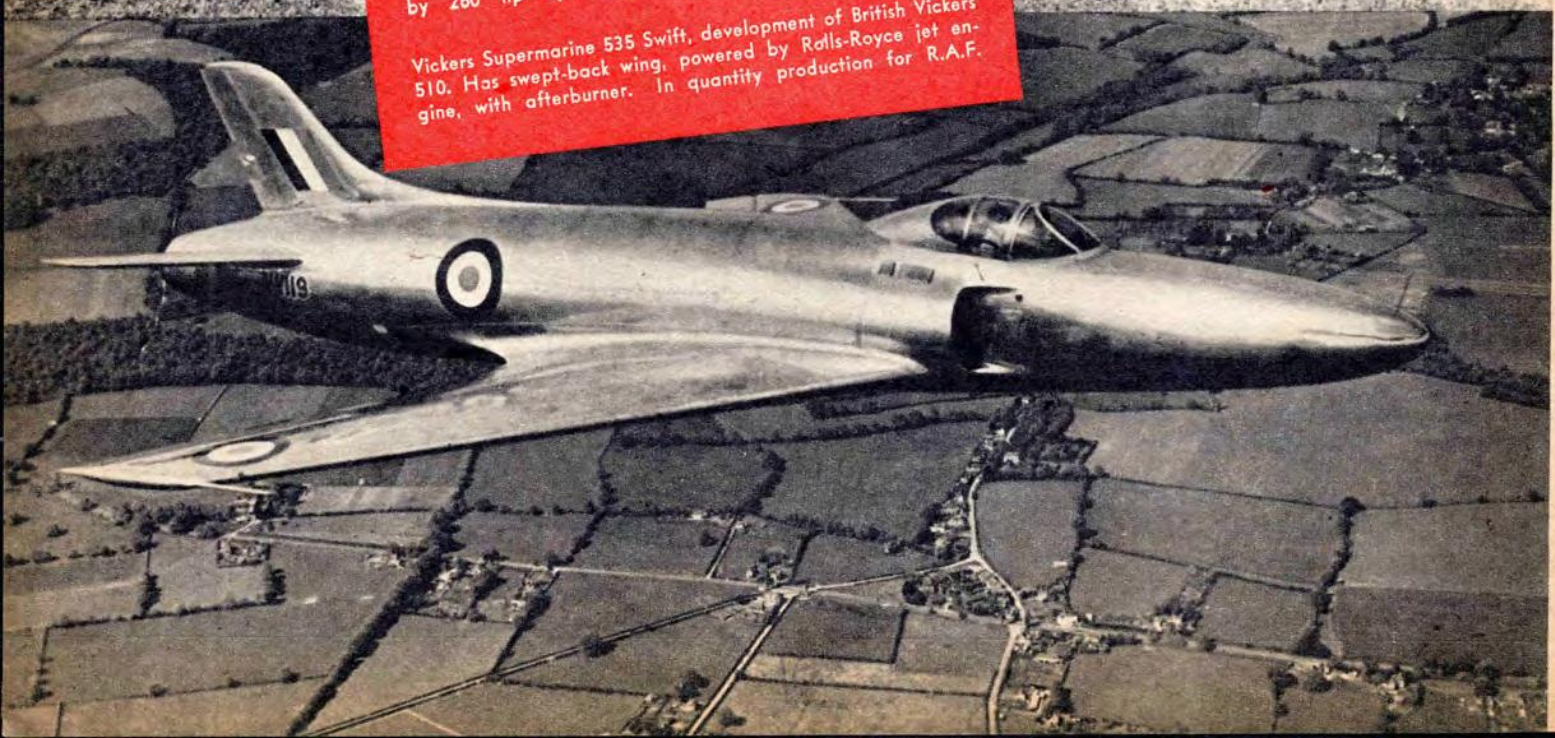


In addition to six 20-mm cannon, the Northrop F-89 Scorpion all-weather fighter has provision for 16 five-inch high-velocity rockets. The plane is in operational service.



Courier, latest model of slow-flying, slow-landing Helio-plane, does away with the large 9 ft. prop. is powered by 260 hp Lycoming. Was demonstrated at Detroit.

Vickers Supermarine 535 Swift, development of British Vickers 510. Has swept-back wing, powered by Rolls-Royce jet engine, with afterburner. In quantity production for R.A.F.





A large, multi-story industrial building with a flat roof and several windows. The name "McDONNELL" is written in large, bold, sans-serif capital letters across the top of the building. Below it, "Aircraft Corporation" is written in a cursive script.

McDONNELL

# ..... Highlights

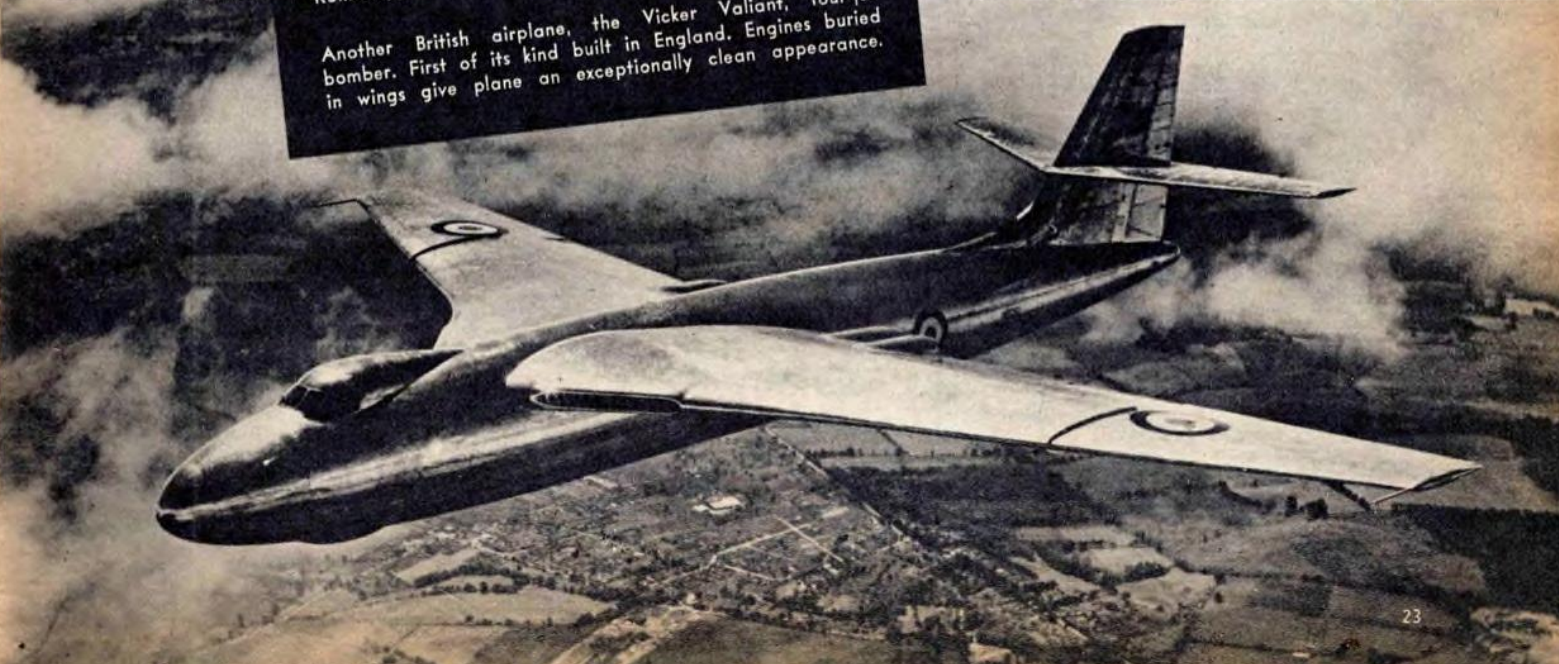
*Aircraft Corporation*

A sleek, delta-wing jet fighter with a very long, pointed nose and a single vertical stabilizer. It is parked on a tarmac in front of the McDonnell Aircraft Corporation building.

The Demon, McDonnell Aircraft's newest Navy jet fighter, designated XF3H-1, was recently test flown at St. Louis, Mo. Engine rated at better than 7000 lbs. thrust.



A British experimental jet plane; the Handley-Page 88. It has a special wing of double gull-shape. Powered by Rolls-Royce Nene engine. Note bullet-shape fairing on tail.

A large, four-engine jet bomber with a very clean, streamlined design. It has a long, pointed nose and a large, rectangular tail. It is shown in flight, banking to the left, with a city visible below.

Another British airplane, the Vicker Valiant, four-jet bomber. First of its kind built in England. Engines buried in wings give plane an exceptionally clean appearance.





JANUARY 1952 • 35 CENTS

# Air Trails



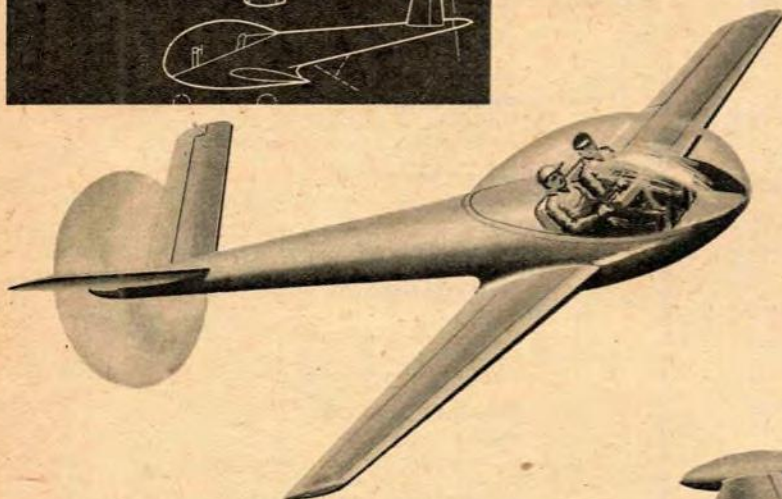
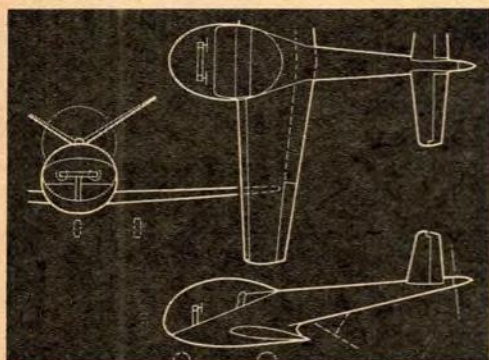
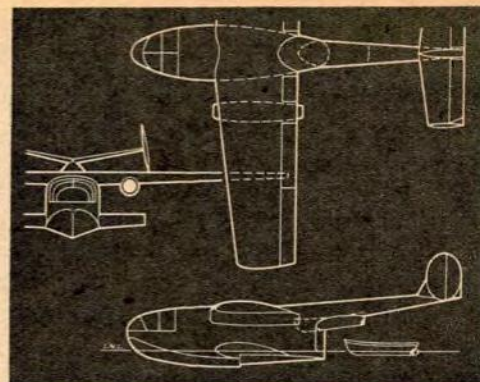
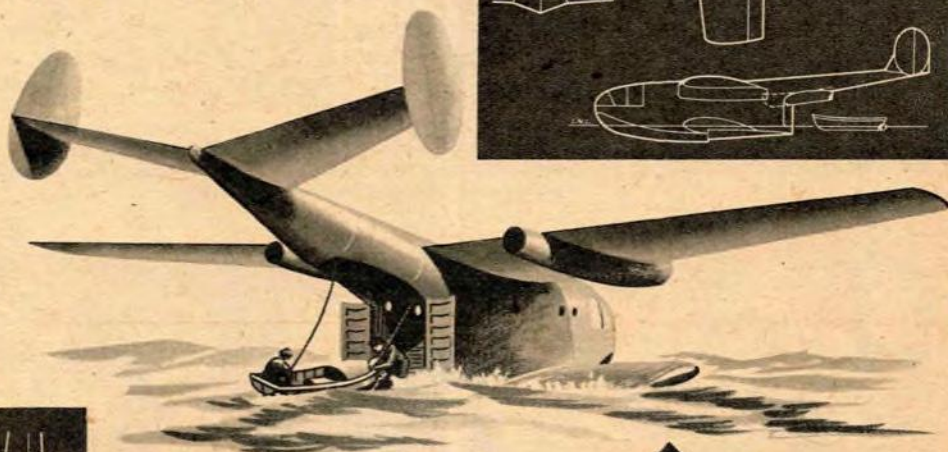
**Atom-Powered Planes • Latest dope on Midget Air Racers  
Plans for Chester Racer • Record Jet • Radio Models**



# Airmen of Vision

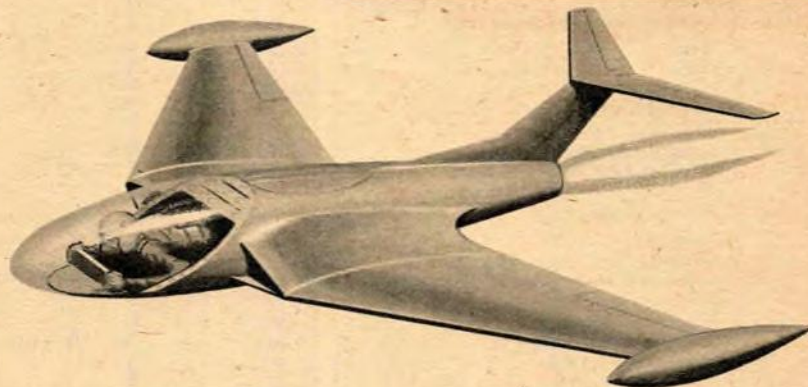
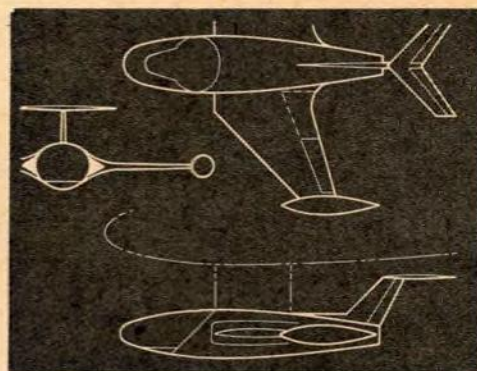
## DESIGN COMPETITION

A very unusual personal plane, by William Kubiak of St. Charles, Mo. An extremely clean design with completely sealed aileron and tail gaps to insure minimum drag. Equipped with leading and trailing edge flaps. Powerplant is 185 hp Hermann cam engine driving propeller through an extension shaft. Bubble canopy aids visibility.



Parasite fighter by James J. Walter of Pullman, Wash. Two can be carried by B-36 type bomber attached to pylons. Pilot lies prone. Nose section jettisonable to permit escape. Two 20 mm cannon. Top speed 600 mph.

Most imaginative design of month is rescue plane by 15-year-old Frank O'Blak, Jr., of New York City. Has boat attached to boom. Jet engines eliminate propeller danger while performing rescue duty. Inboard stabilizing floats act as gangplank, carry fuel. Wingspan 72 ft.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any usual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

Judges. The designs may be of any type, commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



# Mid-jet Racers



**Tiny speedsters powered by jet engines are logical successors to present-day 190 cu. in. midget racers**

■ It would seem that the midget racing plane has reached its ultimate in speed, based on present requirements as far as engine power and displacement are concerned. The amazing speed of 199 mph plus by John Paul Jones in *Shoestring* during qualification trials at the National Air Races in Detroit can be topped by little more than a couple of miles with the now classical midget design. What next, then? Recent announcement by the Continental Motors Corp. of acquiring manufacturing rights for small jet engines from the French Turbomeca concern injects new hope for a jet class midget racer pictured on this page. Especially suitable for this purpose is the 330-lb.-thrust Palas. With this type of powerplant the "mid-jet" racer should have no trouble reaching a speed of 300 mph or better. On the following pages we present the latest developments in current 190 cu. in. class ships as seen in Detroit.



# RESERVE POWER for Freedom!



In fighter planes, in bombers, and on the ground, it is the graduates of the Air Force ROTC who build America's strength in the air. It is the Air Force ROTC students of today—the Air Force officers of Tomorrow—who make up our country's *Reserve Power for Freedom*.

As an AF ROTC student at PARKS COLLEGE, you may complete your schooling—without interruption—and receive a commission as Second Lieutenant in the Air Force Reserve.

At the same time, the schooling you receive in your chosen field of aviation will equip you to make rapid progress toward a position of leadership in either military or commercial aviation.

Upon graduation, you will receive a Bachelor of Science in Aeronautics Degree from Saint Louis University—the first university west of the Mississippi.

Make your first step toward the finest possible education in aviation, and a commission in the Air Force Reserve by filling out the coupon below.

## ENTRANCE REQUIREMENTS

Applicants must be graduates from a 4-year high school, of good moral character and demonstrated ability. Next PARKS enrollment dates, January 4-5, Winter Semester.

**MAIL THIS COUPON** *today!*

**PARKS COLLEGE  
OF  
ST. LOUIS UNIVERSITY**



2012 CAHOKIA ROAD

EAST ST. LOUIS, ILL.

PARKS COLLEGE OF SAINT LOUIS UNIVERSITY  
2012 Cahokia Road, East Saint Louis, Illinois

I am interested in:

☐ Air Transportation

☐ Aeronautical Engineering

☐ Aircraft Maintenance Engineering

Name..... Age.....

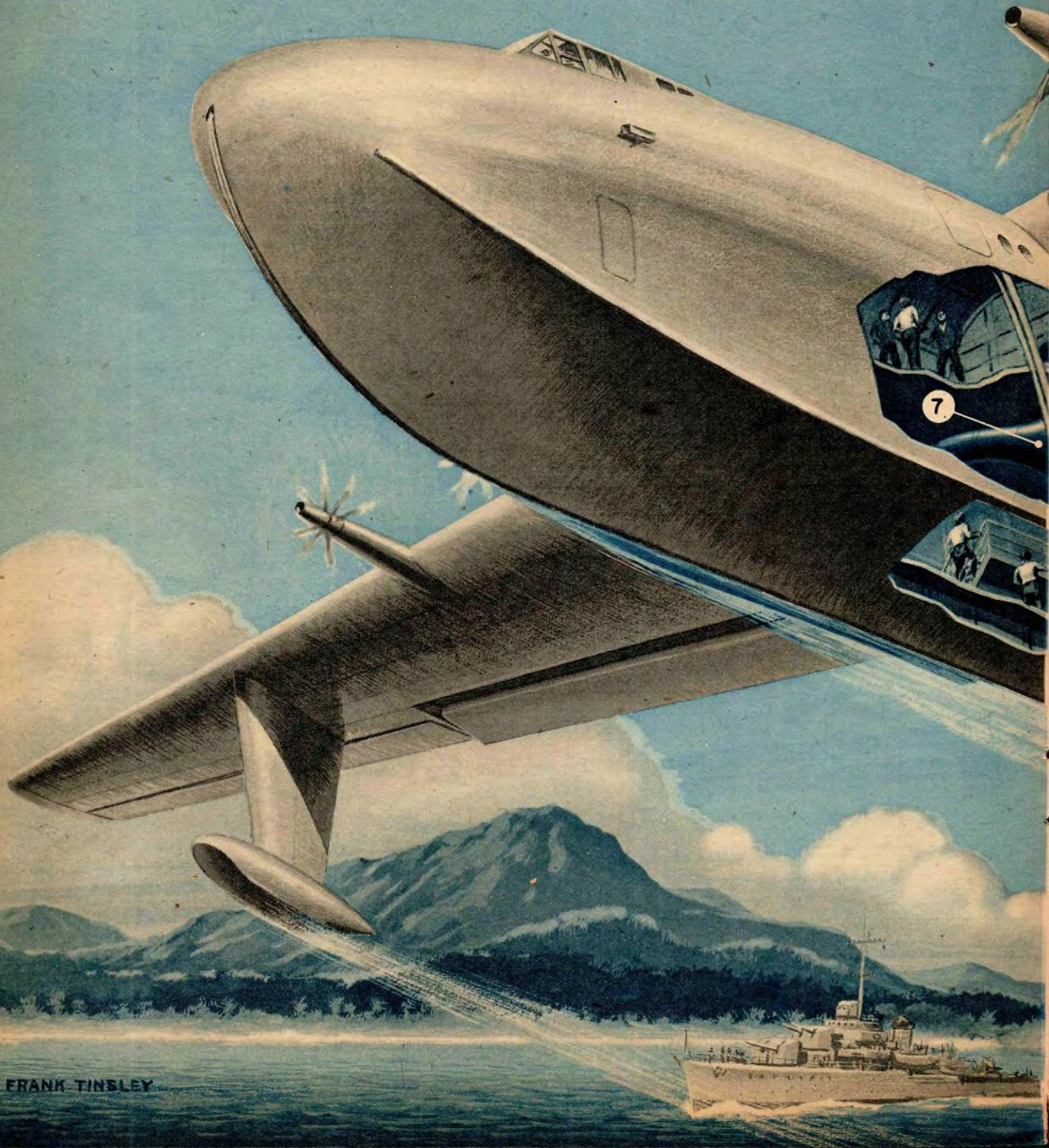
Address..... Zone.....

City..... State.....



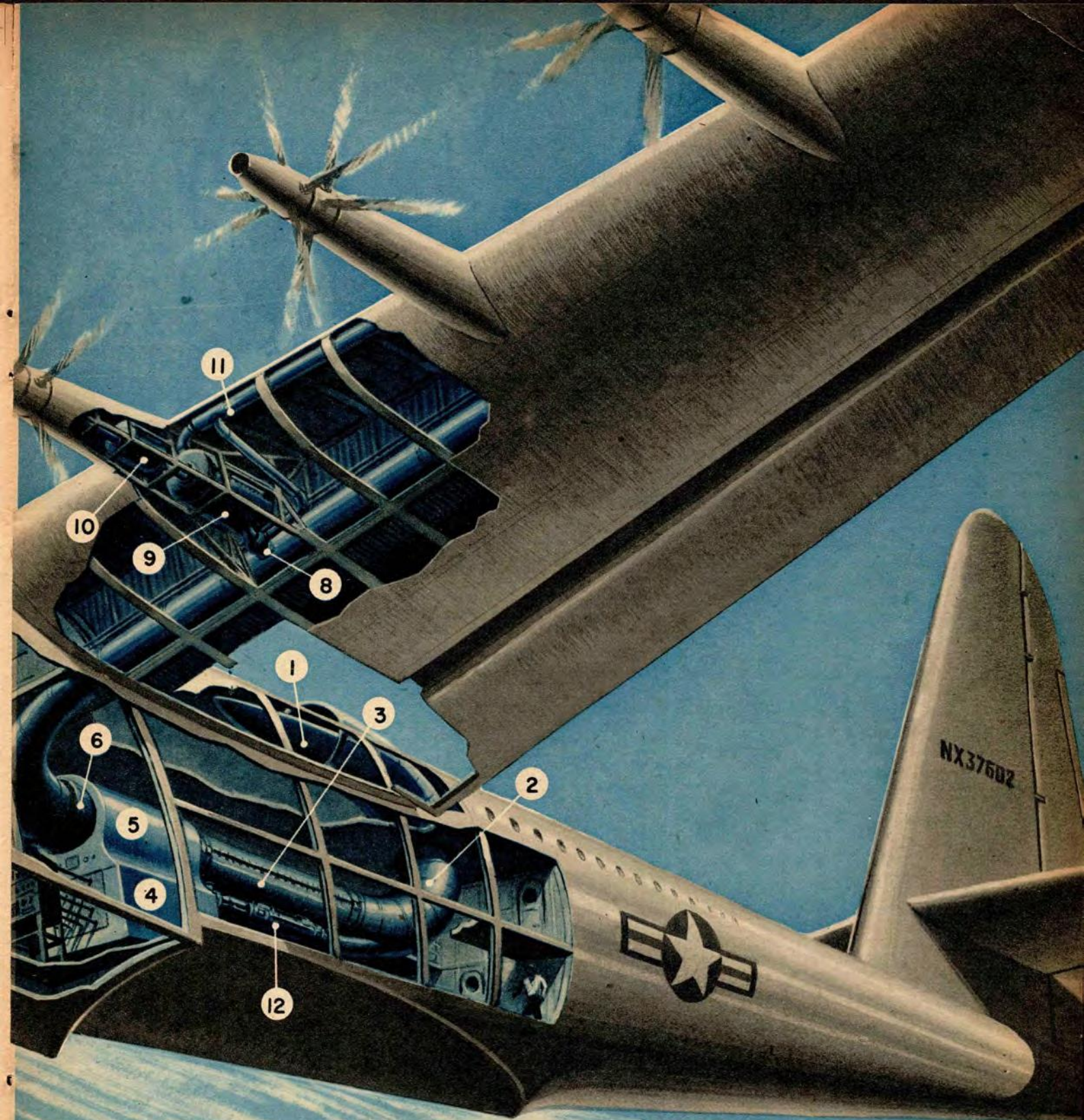
# A-Power Transport

Based on Howard Hughes' gigantic flying boat, the atom-powered airplane is depicted here using as driving energy heat from nuclear fission which operates its hot-air turbines. Work on the development of such a powerplant is now being done by General Electric Co.; Consolidated-Vultee Aircraft Corp. is charged with building the airframe.



FRANK TINSLEY





View of Hughes "Hercules" cut away to show possible layout of atomic powerplant using air as an operating medium.

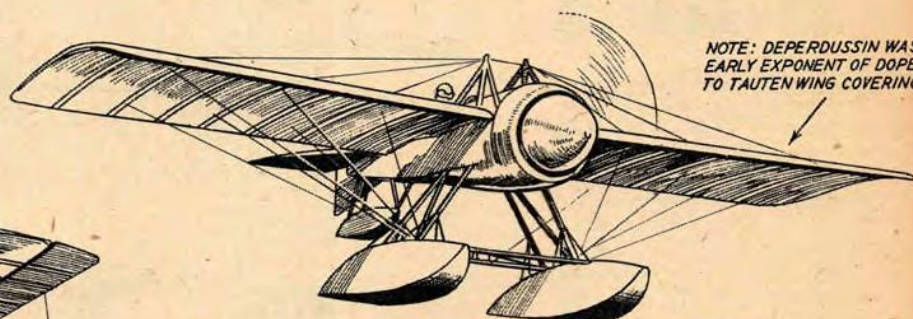
1. Air inlet scoop positioned atop fuselage to avoid spray.
2. Air is conducted forward through U-ducting.
3. Large axial compressor feeds air into heat exchanger.
4. Shielded atomic pile with automatic controls generates heat.
5. Liquid sodium-potassium alloy circulating through zirconium tubes transfers atomic heat to air as it passes through coils of shielded heat exchanger.
6. Hot compressed air actuates turbine which drives compressor, powers pumps, generates current, etc.
7. Heavily insulated pressure ducts pipe hot compressed air to individual powerplants in wings.
8. Waste gate with by-pass to exhaust duct diverts air for throttle control.
9. High-speed turbine drives propellers.
10. Gearing reduces turbine rpm to prop speed.
11. Waste air duct inside leading edge of wing provides thermal anti-icing.
12. Auxiliary jet engine provides heat and power for starting.



# AIR PROGRESS

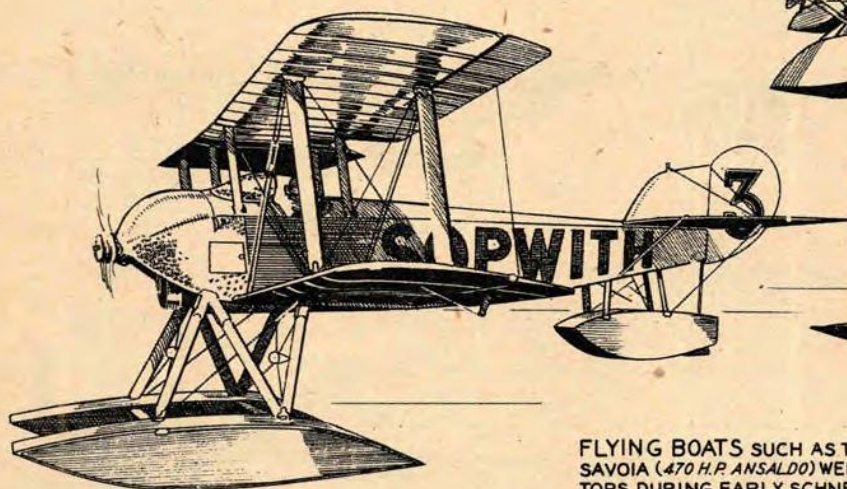
By DOUGLAS ROLFE

## Schneider Trophy Races



NOTE: DEPERDUSSIN WAS EARLY EXPONENT OF DOPE TO TAUTEN WING COVERING

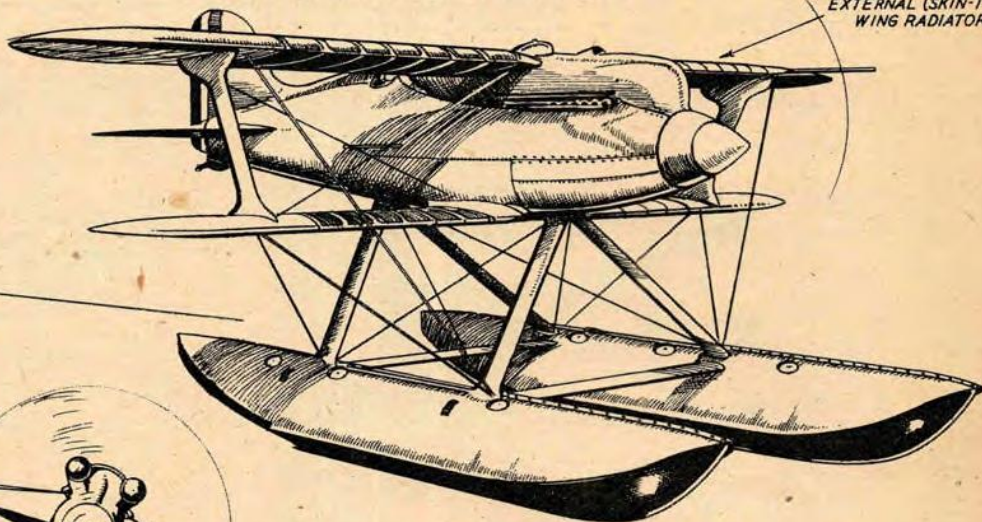
▲ 1913 FIRST WINNER WAS A STANDARD 3-PLACE DEPERDUSSIN (160 H.P. GNOME) WHICH WAS USED AS A LAST RESORT WHEN THE 120 M.P.H. DEP. RACER SUFFERED MINOR DAMAGES - WITHDREW



1914 WINNER WAS THE TINY ▲ SOPWITH "BABY" (100 H.P. MONO-GNOME), AN IMPROVED VERSION OF THE EARLIER "TABLOID" BIPLANE BUILT BY THIS FIRM. IT AVERAGED NEARLY 90 M.P.H. AND BROUGHT THE CUP TO G.T. BRITAIN

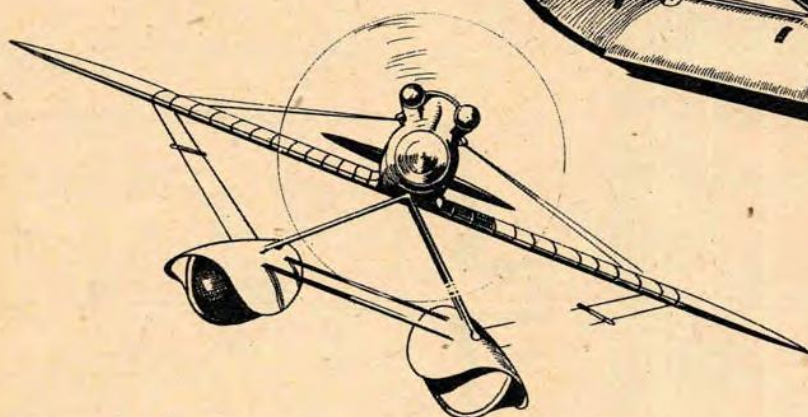


FLYING BOATS SUCH AS THIS TRIM SAVOIA (470 H.P. ANSALDO) WERE TWICE VICTORS DURING EARLY SCHNEIDER RACES. THIS BOAT WON THE 1920 RACE FOR ITALY



EXTERNAL (SKIN-TYPE) WING RADIATORS

▲ HIGH PEAK IN BIPLANE RACERS WAS REACHED IN THIS CURTISS RACER (600 H.P. CURTISS) WHICH CAPTURED THE 1923 CONTEST AT THE THEN REMARKABLE SPEED OF 232 M.P.H. TO GIVE U.S. 2 SUCCESSIVE WINS (1923 WINNER WAS CURTISS CR-3 BIPLANE)



◀ LOW FRONTAL AREA EXTERNALLY-BRACED MONOPLANES WERE INTRODUCED BY THE ITALIAN TEAM IN 1926 WHEN THEY CAPTURED THE CUP WITH THE MACCHI M.39 (800 H.P. FIAT) SHOWN HERE.

The Jacques Schneider International Maritime Trophy Races were initiated by the founder in December 1912, and first took place in April 1913, with only France and America participating. The entrees were limited to seaplanes of all types, and the entire course was over water and amounted to about 200 land miles with four check points which had

to be passed within easy view of the observers.

In the earlier races most of the competition was provided by aircraft manufacturers or private individuals, but as the cost of producing fast racing planes increased these contestants dropped out and national teams sponsored by the individual governments replaced them. First of such teams



INTERNAL (NOT SKIN-TYPE)  
WING RADIATORS

OIL COOLING RADIATORS

AILERON MASS BALANCE

◀ 1931 FINAL WINNER SUPERMARINE S.6B (2,300 H.P. ROLLS-ROYCE) UPPED AVERAGE SPEED TO 407.5 M.P.H., WON THE TROPHY OUTRIGHT FOR GT. BRITAIN AND THUS BROUGHT THESE HISTORIC INTERNATIONAL CONTESTS TO THEIR CONCLUSION.

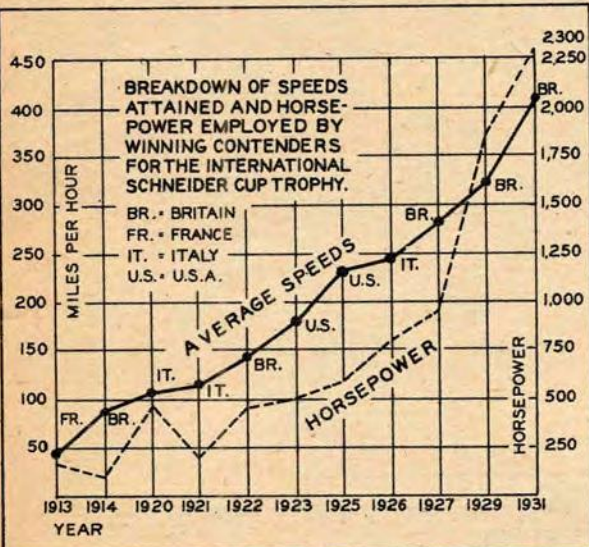
▲ LAST FRENCH CONTENDER FOLLOWED THE SAME GENERAL DESIGN SET BY MACCHI IN 1926. THE DEWOITINE D.H. 41 WAS A 1931 ENTRY—FAILED TO PLACE IN CONTEST

MOST NOVEL CONTESTANT WAS THIS 1929 ITALIAN ▲ ENTRY, A SAVOIA-MARCHETTI (TWO 1,000 H.P. ENGINES IN TANDEM). FLOATS APPEAR NEEDLESSLY LONG FOR EFFICIENCY

DOUGLAS  
ROLFE

▲ FORLORN HOPE WAS AL. WILLIAMS'S SPECIAL MERCURY RACER (1250 H.P. X-TYPE PACKARD)—LAST (1929), AND UNSUCCESSFUL U.S. BID TO RECAPTURE THE TROPHY. IT WAS WILLIAMS'S SECOND TRY.

▲ 1927 WINNER THE 900-1,050 H.P. THREE-BANK NAPIER-SUPERMARINE S.5 AVERAGED 281 M.P.H. TO REGAIN THE TROPHY FOR BRITAIN (ANOTHER BRITISH ENTRY WAS FASTER BUT DROPPED OUT OF THE RACE IN 4TH LAP)



to compete was that of the U.S. Navy which also was first to bring really high-speed racing into these events. From then on the struggle was largely between the British and the Italians, and when the former won three races in succession the trophy passed automatically into permanent possession of Great Britain, and the races came to an end.

The illustrations here show some of the more interesting contestants, winners and losers alike. The Schneider races undoubtedly had an important influence on air progress in general and air speeds in particular. Mounting speeds and engine power induced by the races are graphically depicted in the diagram above.



FEBRUARY 1952 • 35 CENTS

# Air Trails®



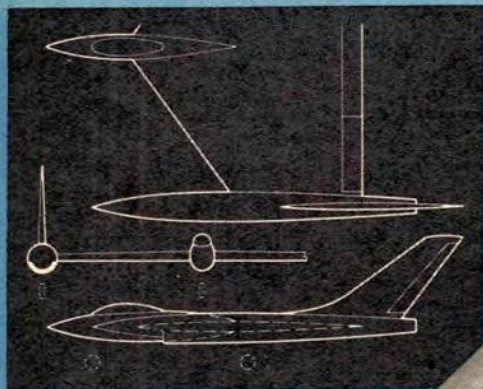
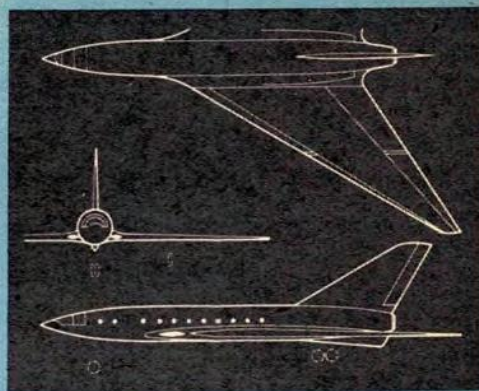
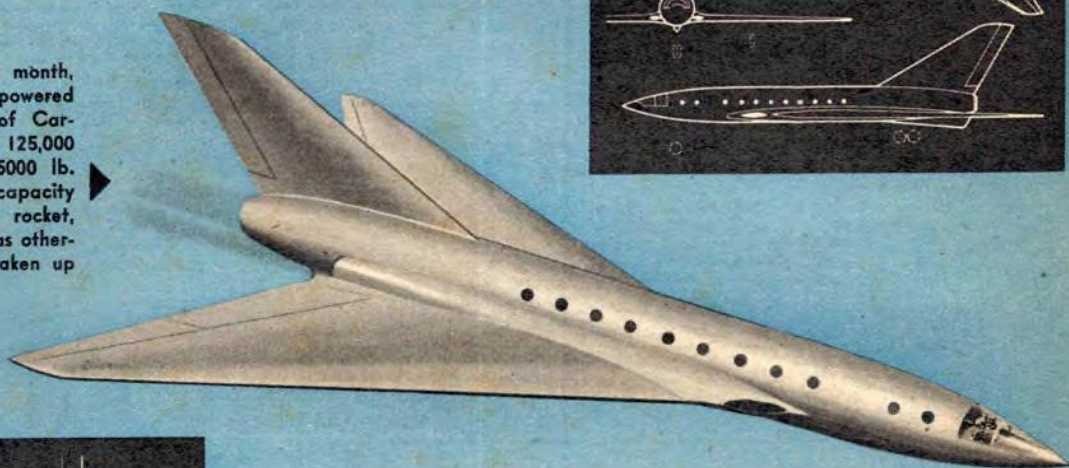
Everitt's Phenomenal Wakefield—McBrayer's Half-A Team Racer



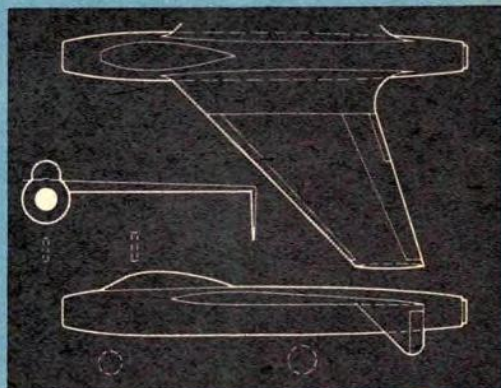
# Airmen of Vision

## DESIGN COMPETITION

Number one design of the month, a delta-like rocket and jet powered transport by R. W. Flint of Carmichael, Calif. Powered by a 125,000 lb. thrust rocket and two 5000 lb. thrust turbo-jets. Passenger capacity for 24. With this type of rocket, atomic fuel will be required as otherwise all available space is taken up by propellant.



Twin-jet fighter by Maurice E. Libson of New Haven, Conn. Has trapezoid type wing with long jet nacelles at each wing tip on which are mounted vertical fins and rudders. Aileron and elevator controls on wing's trailing edge. Design offers plenty of space for both armament and fuel load. Speed 680 mph.



Fingerwing. All-weather interceptor by 13-year-old Timothy Voorocek of Granger, Tex. Powered by 7200 lb. thrust jet engine. Span is 28 ft., length 27 ft. Estimated speed 750 mph. Range 1100 mi. Ceiling is 43,000 feet.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



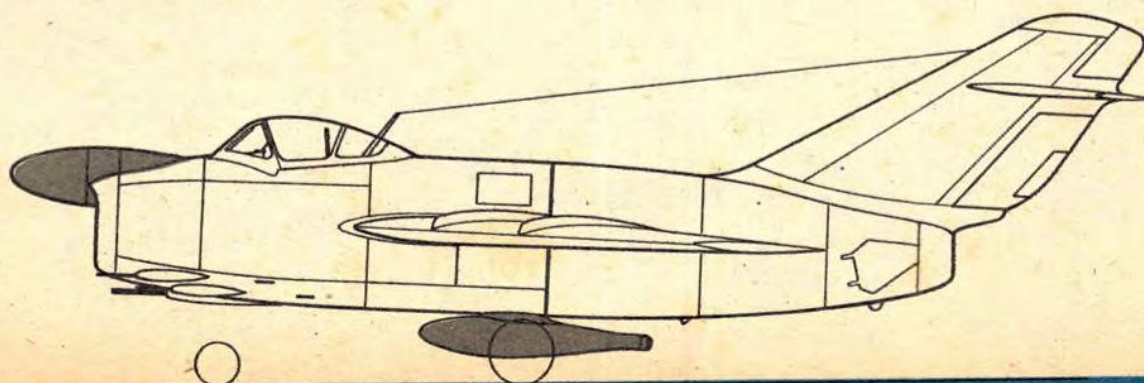


MiG-15 bis (second) equipped with radar and solid fuel rato. Another modification is a more powerful engine of at least 6500 lbs. thrust.

# REDS' F-86

All-weather fighter addition to Russian AF bears remarkable resemblance to our F-86D

■ The first known major modification of the Russian MiG-15 was reported to have made its initial appearance, outside of USSR, over the Balkans. Now, these improved MiGs have been sighted singly and in pairs over East Germany and Korea. Majority of improvements are said to be external. Most interesting is the radar snout, believed to house a four-foot dish antenna undoubtedly capable of both search and aiming functions. This is significant development which indicates increased Red interest in all-weather fighters and a switch to radar sighting to overcome gunnery deficiency so evident over "MiG Alley." A bit crude compared with radar nose of our F-86D Sabre, but it suggests that Russians are catching up fast.



Shaded areas show additions to the standard MiG-15 fuselage, radar and rato. Radome adds two feet to fuselage, making it 35'4" long.



**CONSTRUCTION:**  
 WINGS: METAL STRUCTURE  
 LEADING EDGE STIFFENED  
 WITH ALUMINUM SHEET, AND  
 FABRIC COVERING  
 FUSELAGE: METAL BRASS STRUC-  
 TURE, WITH BUILT UP  
 FORMERS AND LONGE-  
 RONS. METAL COVERING  
 BACK TO REAR COCKPIT.  
 FABRIC COVERING ON  
 REAR SECTION, METAL  
 FIN-FINISHING.  
 TAIL UNIT: METAL STRUCTURE  
 WITH FABRIC COVERING  
 GASOLINE TANK CAP  
 COOLING AIR OUTLET  
 CARBURETOR  
 AIR INTAKE  
 EXHAUST  
 STRUTS  
 SPECIAL BOTTOM  
 VIEW:  
 FAIRING  
 METAL AIR FLAPS  
 WING WALK  
 RADIO REFRIG.  
 DIBEDRAL  
 LANDING GEAR  
 IN RETRACTED POSITION  
 STRUT  
 JOINT  
 FIXED STABILIZER  
 TRIM TAB  
 CARBURETOR  
 AIR INTAKE  
 "HELMETED" COWL  
 BRAKING  
 METAL STRUT  
 RUDER  
 HORN  
 STRUT  
 COASTING TAIL WHEEL  
 STRINGERS  
 RADIO MAST  
 RADIO REFRIG.  
 TRIM  
 HINGED COCKPIT COWL'S  
 FOLDING STRENGTHS  
 EXHAUST  
 STRUTS  
 TRIM  
 HINGED  
 SERVICE  
 PANEL  
 PRESSED METAL  
 COIL  
 TORQUE LINK  
 AILERON CONTROL  
 HORN  
 COLOR SCHEME:  
 ALL ALUMINUM OR  
 DARK BROWN. RED  
 STARS OUTLINED  
 WITH WHITE.

**POWERPLANT:**  
 ONE 160HP M11P-1  
 FIVE CYLINDER AIR COOLED  
 RADIAL ENGINE  
 VISHVA VARIABLE PITCH  
 METAL PROPELLOR

**SK-18 (Yak-18)**  
 RUSSIAN TRAINER  
 SCALE: 1/4" = 1' 0"  
 DRAWN BY:  
 G. M. K. K. K.

POWERPLANT:  
ONE 160HP M11RE-1  
FIVE CYLINDER AIR COOLED  
RADIAL ENGINE  
VISH(6) VARIABLE PITCH  
METAL PROPELLOR

**Yak-18 (Yak-18)**  
**RUSSIAN TRAINED**

SCALE:  $\frac{1}{4}'' = 1'0''$  DRAWN BY:

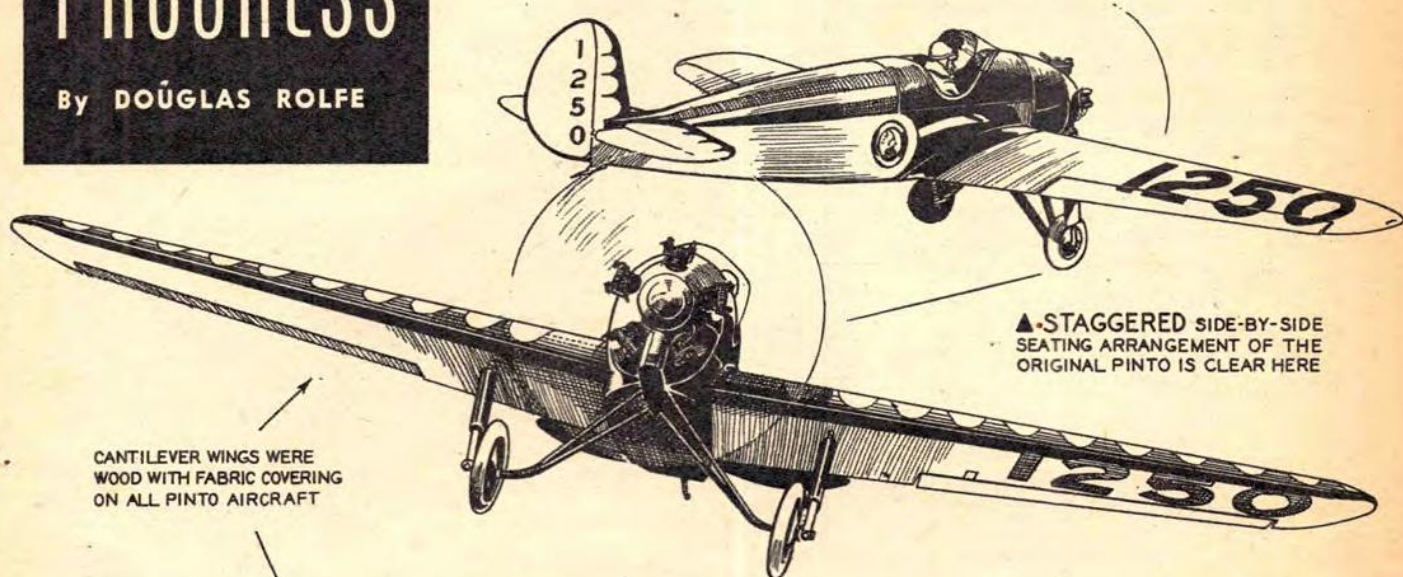
Bydgoszcz. Karykatura



# AIR PROGRESS

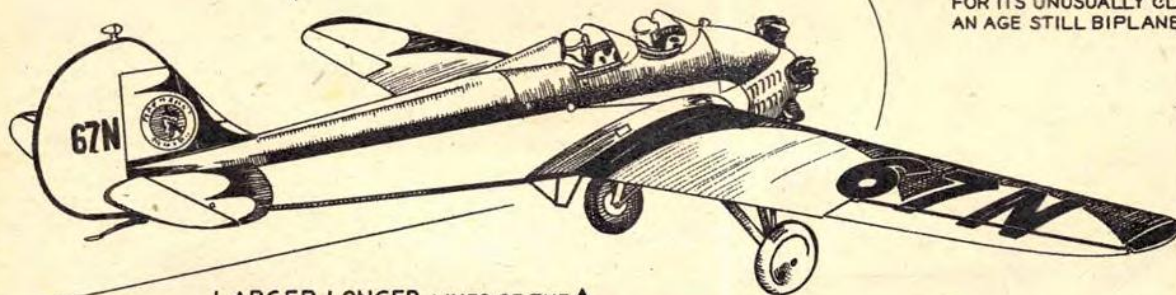
By DOUGLAS ROLFE

## The Mohawk "Pinto"



▲ STAGGERED SIDE-BY-SIDE SEATING ARRANGEMENT OF THE ORIGINAL PINTO IS CLEAR HERE

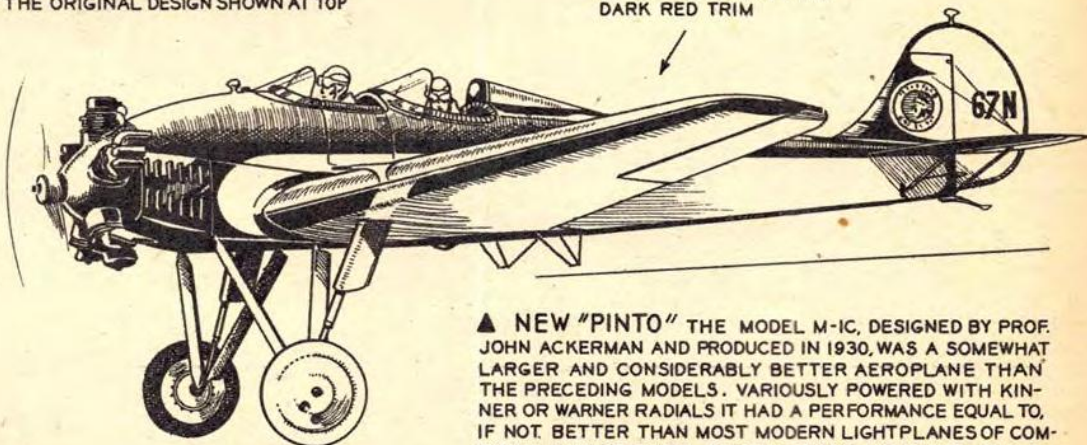
CANTILEVER WINGS WERE WOOD WITH FABRIC COVERING ON ALL PINTO AIRCRAFT



▲ FRONTAL APPEARANCE OF THE ORIGINAL PINTO WAS REMARKABLE FOR ITS UNUSUALLY CLEAN LINES IN AN AGE STILL BIPLANE-CONSCIOUS

▲ LARGER, LONGER LINES OF THE RE-DESIGNED PINTO ARE APPARENT IN THIS VIEW WHICH SHOWS THE AEROPLANE IN A SIMILAR POSITION TO THAT OF THE ORIGINAL DESIGN SHOWN AT TOP

COLOR SCHEME OF LATER PINTOS WAS CREAM WITH DARK RED TRIM



▲ NEW "PINTO" THE MODEL M-1C, DESIGNED BY PROF. JOHN ACKERMAN AND PRODUCED IN 1930, WAS A SOMEWHAT LARGER AND CONSIDERABLY BETTER AEROPLANE THAN THE PRECEDING MODELS. VARIOUSLY POWERED WITH KINER OR WARNER RADIALS IT HAD A PERFORMANCE EQUAL TO, IF NOT, BETTER THAN MOST MODERN LIGHTPLANES OF COMPARABLE HORSEPOWER. SPECIFICATIONS AT RIGHT ►►►

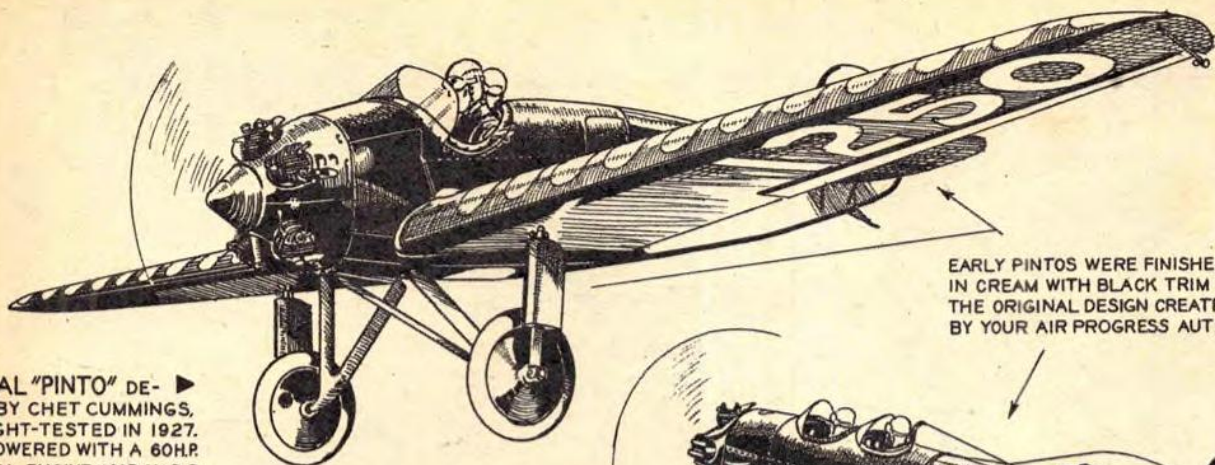
Despite the brief period during which these interesting planes were produced, they have a definite place in Air Progress since they were probably the first to approach the personal plane market from a modern angle (in the U.S.A., that is). It is difficult today to realize the prejudice which existed a quarter of a century ago toward low-wing, and especially cantilever low-wing design, but it did exist

and many pilots refused to regard such ships as stable or even safe. Of course, the same prejudice had appeared much earlier against the high-wing or parasol monoplane. It was naturally exploded by actual performance.

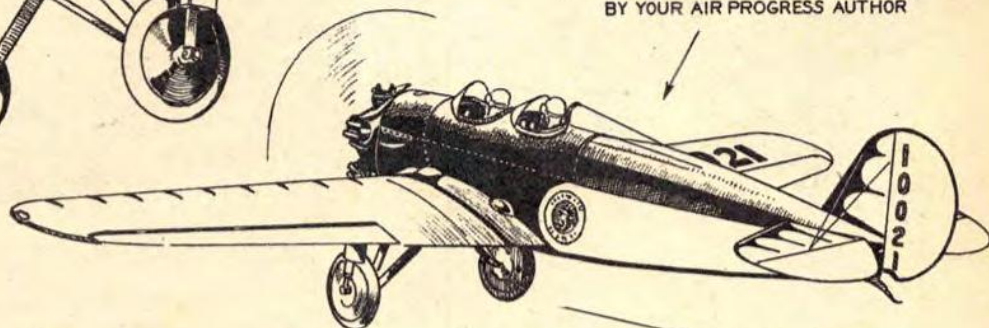
The Mohawk "Pinto" series had its beginning in late 1927 when four young men formed the original company and proceeded to build the prototype model by hand in a rented



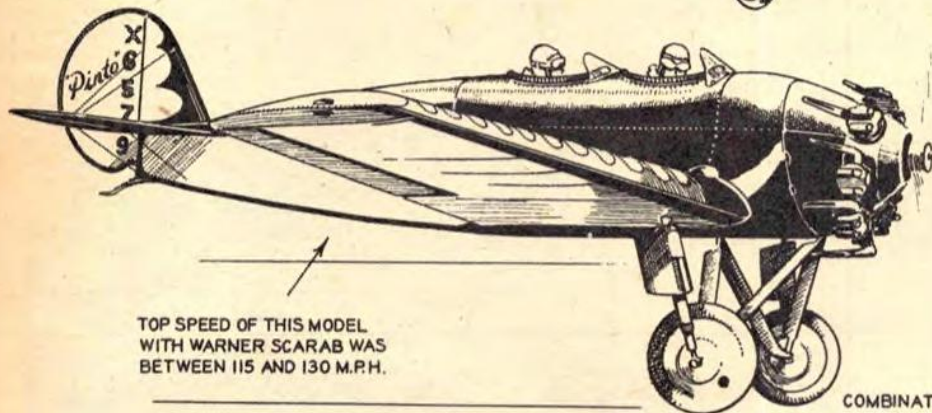
ORIGINAL "PINTO" DESIGNED BY CHET CUMMINGS, WAS FLIGHT-TESTED IN 1927. IT WAS POWERED WITH A 60 H.P. RADIAL ENGINE AND HAD 2 STAGGERED SIDE-BY-SIDE COMFORTABLE SEATS. FUSELAGE AND CONTROL SURFACES WERE OF STEEL TUBE CONSTRUCTION. NO RELIABLE PERFORMANCE FIGURES EXIST FOR THIS SHIP.



EARLY PINTOS WERE FINISHED IN CREAM WITH BLACK TRIM TO THE ORIGINAL DESIGN CREATED BY YOUR AIR PROGRESS AUTHOR

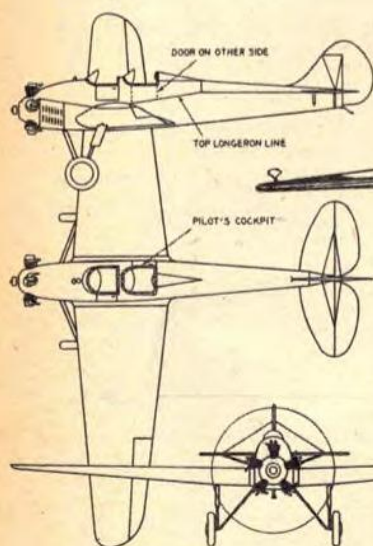


TWO STAGES IN THE DEVELOPMENT OF THE PINTO ARE DEPICTED HERE. AT LEFT WE SEE THE FIRST MODIFICATION OF THE ORIGINAL PINTO WITH TANDEM SEATS AND 110 H.P. WARNER SCARAB ENGINE. THE PRODUCTION MODEL (ABOVE) HAD SAME AIR FRAME, MINOR DESIGN REFINEMENTS, AND WAS POWERED WITH A 70 H.P. VEE-LIE ENGINE WHICH GAVE IT A MAXIMUM SPEED OF 105 M.P.H. PRICE WAS \$2,775.



TOP SPEED OF THIS MODEL WITH WARNER SCARAB WAS BETWEEN 115 AND 130 M.P.H.

COMBINATION HATCH-DOOR WAS ACTUALLY LOCATED ON OTHER SIDE OF THIS AIRCRAFT



\*MOHAWK PINTO M-1C  
SPAN 34 FT. 11 IN.  
LENGTH 24 FT. 2 1/2 IN.  
HEIGHT 7 FT. 7 IN.  
ENGINE 90 H.P. KINNER  
MAX. SPEED 115 M.P.H.  
CRUISING SPEED 90 M.P.H.  
LANDING SPEED 30 M.P.H.  
RANGE 550 MILES

\*ARMY DESIGNATION - XPT-7

0 3 6 9  
— SCALE IN FEET —

LAST "PINTO" ACTUALLY KNOWN AS THE "SPUR-WING", WAS A CABINIZED MODIFICATION OF THE PINTO MODEL M-1C. IT APPEARED IN 1930 AND WAS POWERED WITH A WARNER SCARAB RADIAL ENGINE. CONFIGURATION AND PERFORMANCE WAS SIMILAR TO THAT OF STANDARD PINTO.

DOUGLAS ROLFE

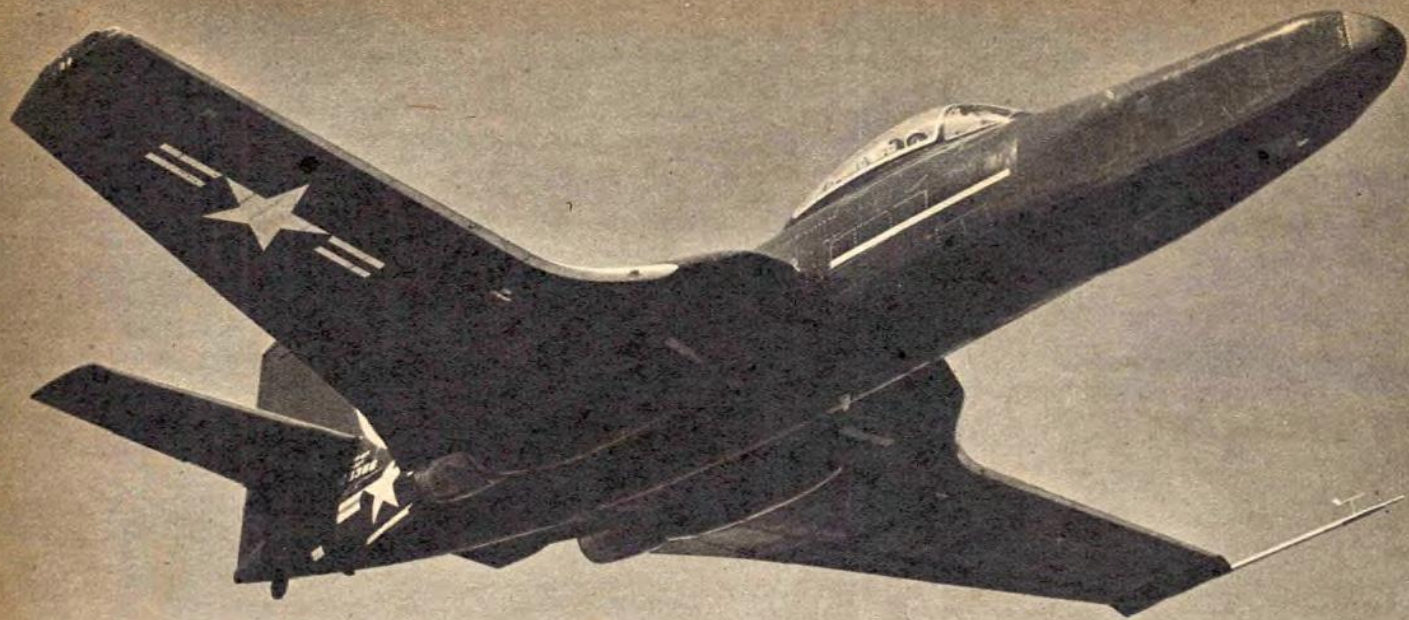
warehouse. This original Pinto was not an entire success. It was, however, flown by many noted pilots, including Col. Charles Lindbergh.

The good looks and radical nature of the design soon attracted capital in the then booming Twenties and a new Pinto was developed. It finally obtained its Approved Type Certificate, though only after a series of near disasters in

which two of the several test pilots (one no less than the late great Charles "Speed" Holman) were obliged to bail out when it failed to recover from a voluntary spin.

The last Pinto was a very different plane although it retained the basic features of the original design. It was also a very good plane and with it the Mohawk Company might have prospered except for the Depression.



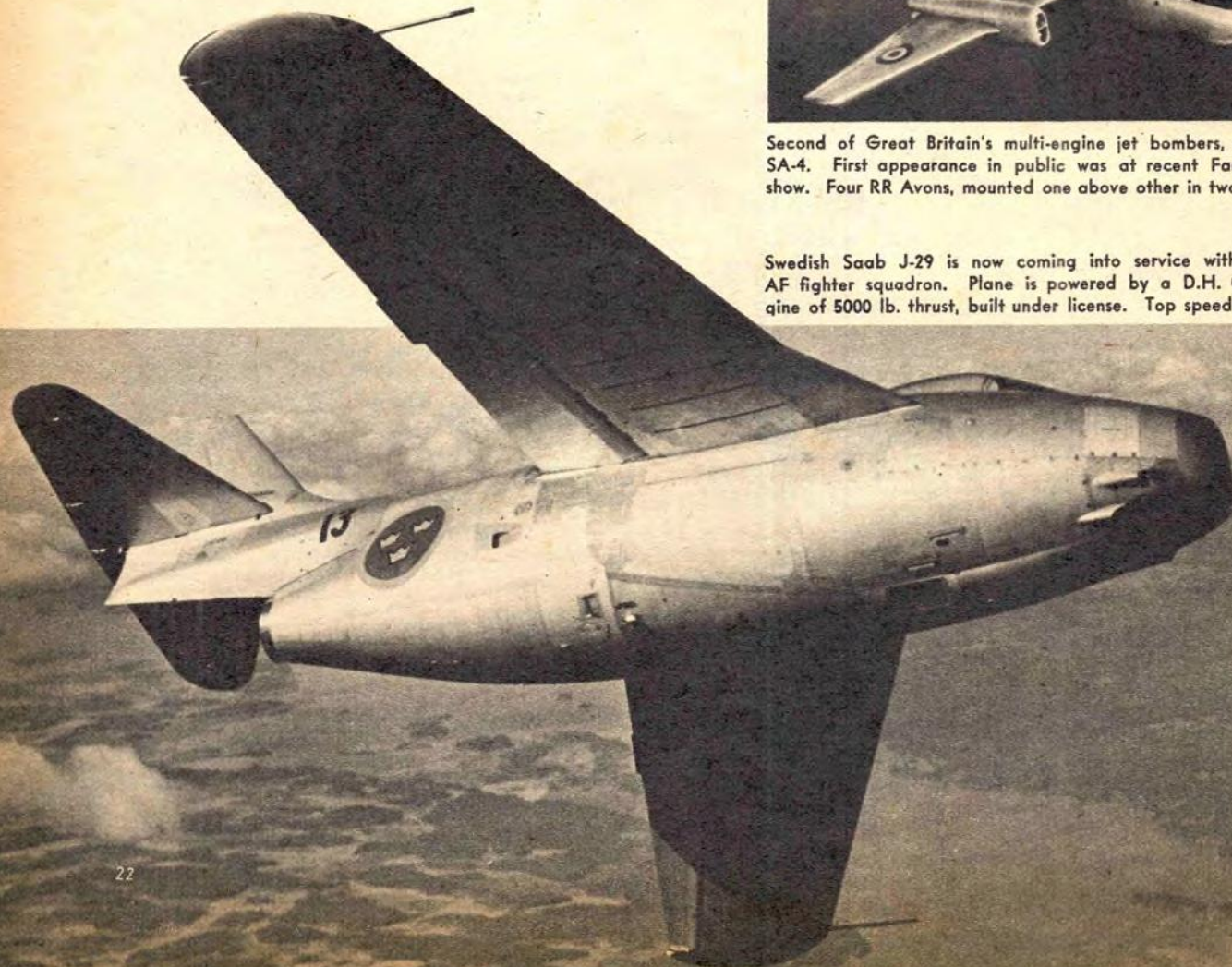


F2H-2P Banshee. First carrier-based jet photographic airplane. Extended nose houses six types of cameras. Ship is same as standard Navy F2H-2 with exception of elongated nose.

## DEVELOPMENT HIGHLIGHTS

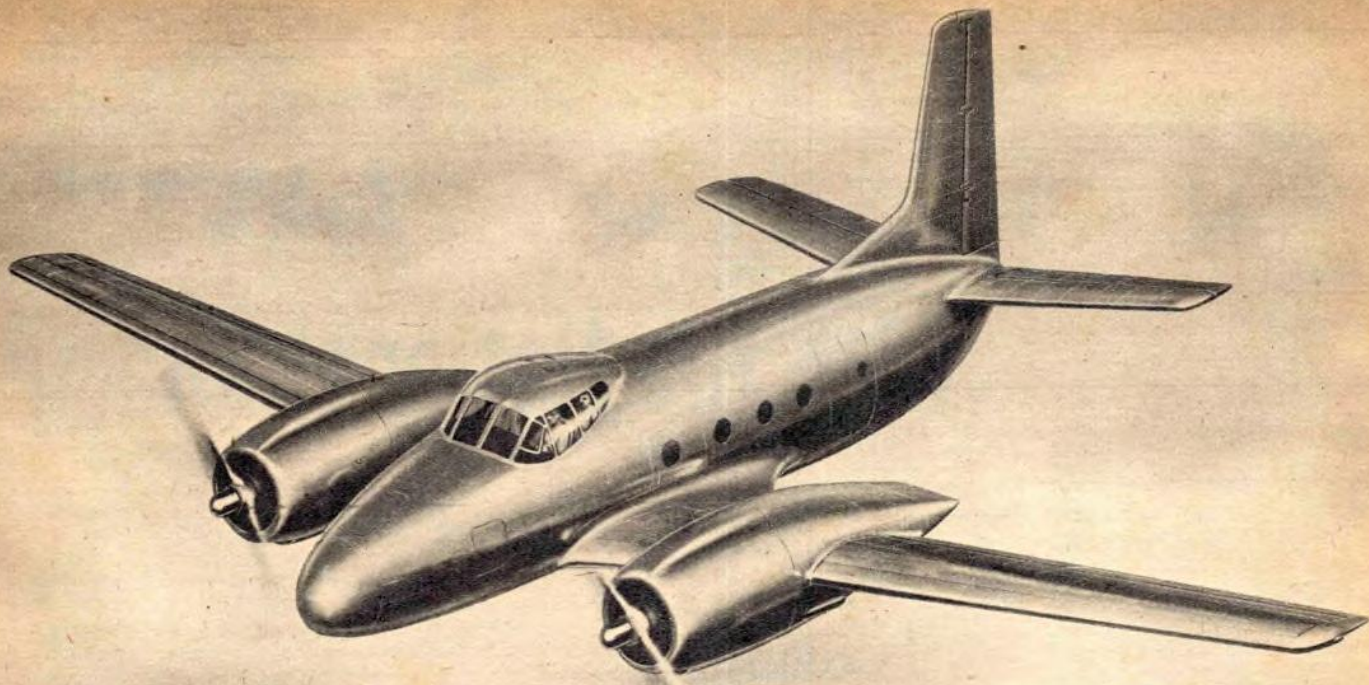


Second of Great Britain's multi-engine jet bombers, the Short SA-4. First appearance in public was at recent Farnborough show. Four RR Avons, mounted one above other in two nacelles.

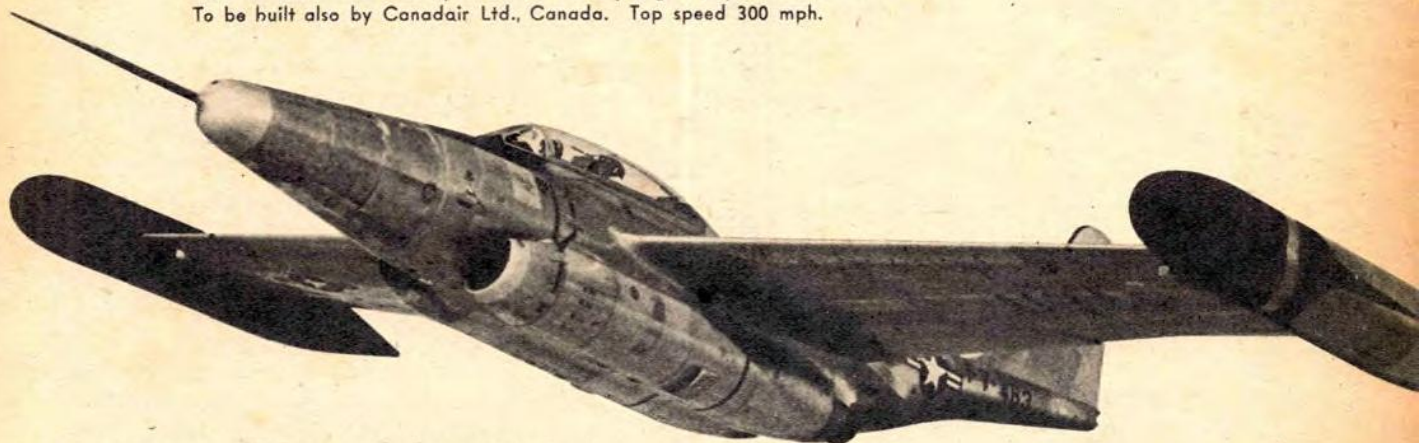


Swedish Saab J-29 is now coming into service with Swedish AF fighter squadron. Plane is powered by a D.H. Ghost engine of 5000 lb. thrust, built under license. Top speed 645 mph.





Beechcraft T-36, latest USAF advanced trainer-transport. Carries crew of four. Two 2300 hp Pratt & Whitney engines, span 70 ft. To be built also by Canadair Ltd., Canada. Top speed 300 mph.



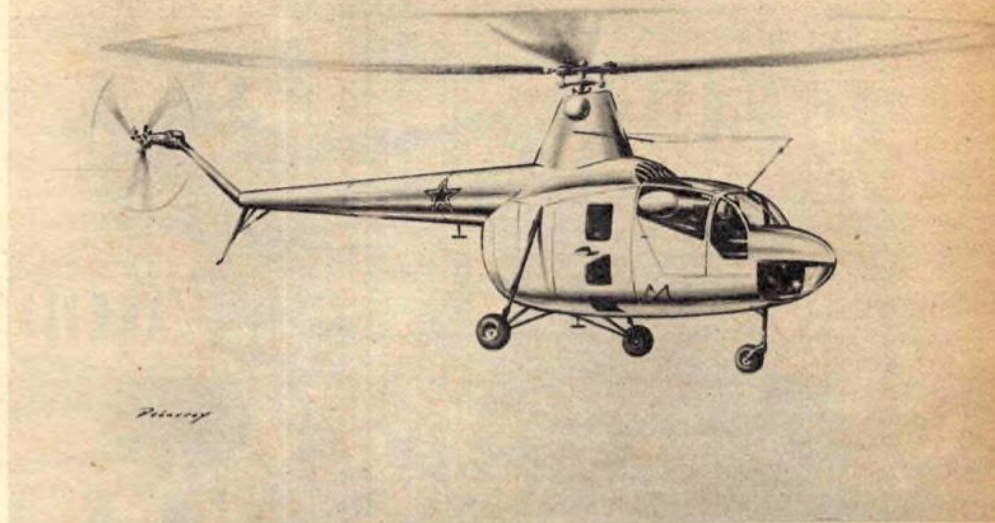
Latest Northrop Scorpion, F-89D, with armament electronically aimed, triggered. Two Allison J-35s with afterburners. Gross weight 40,000 lbs. Rocket armament carried in streamlined containers on wingtips.

Douglas AD-5 Skyraider. Is delivered with conversion kit, which in short time can transform it into either passenger transport, ambulance plane, attack bomber, or anti-submarine hunter-killer.





# Soviet "Sikorsky"



This is No. 3 in the known helicopter development in Russia, and undoubtedly the most successful one. A very orthodox design. Designation of the craft is not known.

■ Along with the two new fighters—one of them the "Super MiG"-19—which made their debut at the last Aviation Day display at Tushino Airdrome near Moscow, there appeared a new helicopter that follows more closely the configuration and thinking associated with Western whirligigs.

Designed by Mikhail Mil, this helicopter is a single-engined, 3-4-place machine with conventional cyclic pitch control arrangements and generally straightforward design with some resemblance to Sikorsky and British Bristol craft.

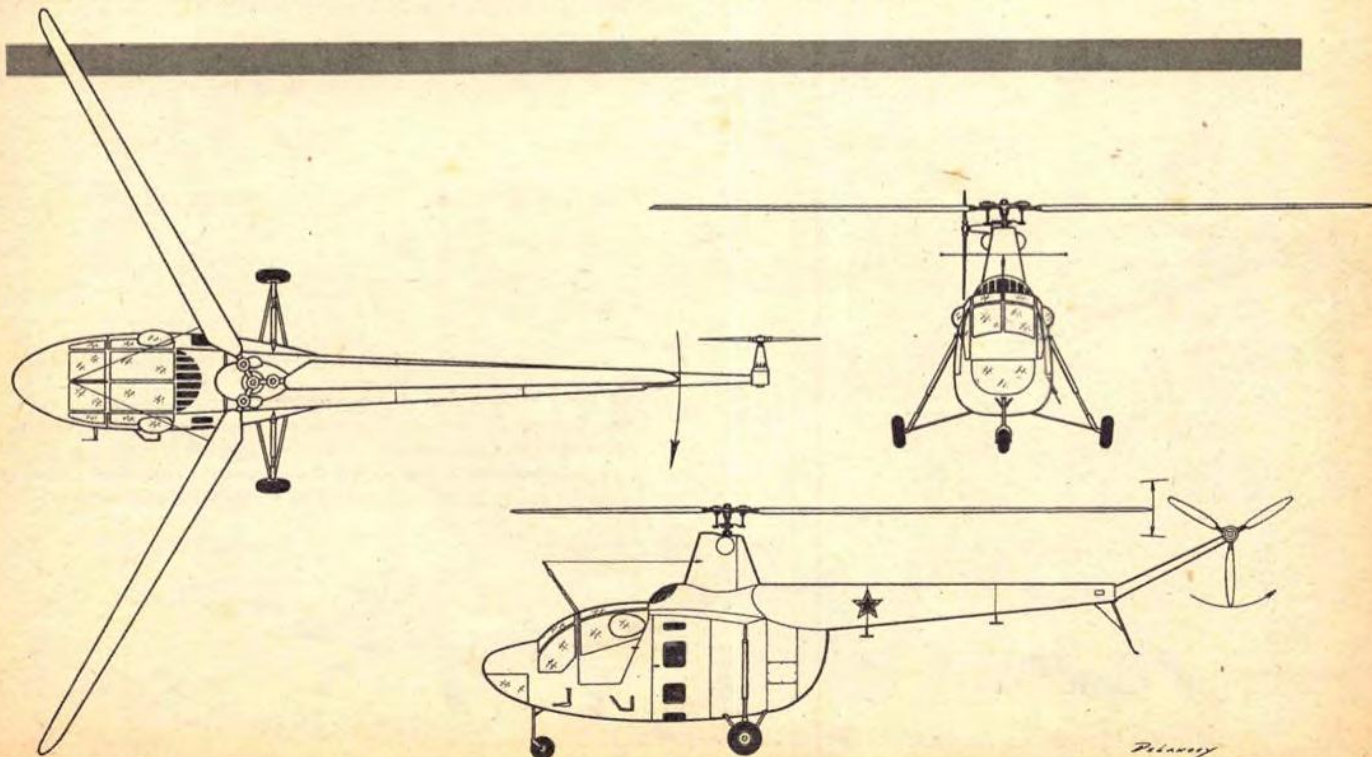
The Red Air Force has, heretofore, progressed slowly with whirling-wing aircraft despite a long-time interest. The outstanding effort, still in the experimental stages according to our sources, was the Omega III designed by Ivan P. Bratukin. This twin-engined 24-passenger 'copter is expected to go into production soon. The second Russian helicopter designer is N. I. Kamov, who produced in 1948 a small co-axial rotor type.

Mikhail Mil is a new designer, and his simple approach

along conventional lines may well spell larger and more rapid production of helicopters in the USSR. Certainly, the Reds cannot be expected to have overlooked the manner in which our helicopters have proved their usefulness in Korea to date in both rescue and assault (vertical envelopment) tactics. And it seems reasonable that Soviet efforts in this direction may take on a new urgency.

Specifications of this new 'copter are as follows:

**Fuselage**—Full-vision cockpit, side-by-side seating. Passenger seats aft, accommodating one or two persons in addition to crew. Overall length with main and tail rotors at minimum position, 44 feet 6 inches. Height, 13 feet 6 inches. **Rotors**—Three blades, wooden construction with metal spar and plywood covering. Aerodynamic tabs fitted at approximately half span of each blade. Blades are fully articulating in both flapping and dragging planes, with adjustable friction dampers on drag hinges. Rotors can be folded to rear for parking or shipboard stowage. Rotation is in counter-clockwise direction. Main rotors, 48 feet 6 inches. Tail rotor, 8 feet 3 inches. **Landing gear**—Tricycle type with castoring nosewheel, and tailskid aft to guard tail rotor. **Powerplant**—Specially modified ASH-21, or new type engine of 300-450 hp. **Weights**: Empty, approximately 3,000 lbs.; load, approximately 1,000 lbs.; gross, approximately 4,000 lbs. **Performance**: Maximum speed at sea level, 100-110 mph. Maximum range, 400-450 miles.





## Famous A-J Products



### A-J FIREBALL

Original U-Control plane. High maneuverability. Kit includes control handle, flying lines, \$695 and wheels.



### U-REELY CONTROL

Keeps flying lines off ground ready for instant use. Take-off unassisted, reel in to land.

**\$750**

With cable flying lines.....\$8.50



### FUEL REGULATOR

Supplies fuel under pressure in any position until tank is dry! Complete with Pressure Fuel Tank.

**\$250**

## Ready to Fly!



### "74" FIGHTER

Does 19 stunts with ease. Smooth finish, cambered wing.....

**10¢**



### A-J INTERCEPTOR

Cambered wings fold for launching, automatically open to soar.

**50¢**



### A-J HORNET

Will R.O.G. and fly 500 ft. 1 Unbreakable prop, 18" cambered wing.

**50¢**



### CEILING WALKER

Helicopter... flies straight up, does aerobatics coming down.

**25¢**



## Flying Two IS TWICE THE FUN!

This is the stunt that always wows the spectators, and it's really easy to do...especially with two A-J Firebabies! They are so maneuverable...so easy to control...that most anyone can learn to fly two of them together. Just remember to fly the leading plane low, the second plane high. Position is easily maintained by moving the arms in and out. For a real flying thrill, try it!

## Jim Walker FIREBABY

Buy it ready to fly, complete with flying lines and full instructions for flying and stunting. Wing span is 19", weight with motor, 3 oz. All parts are finished, painted, fuelproofed. Just slip them together, bolt on wing and motor, "gas up" and you're ready to take off! Without motor...

**\$250**



**\$750**

with motor

Jim Walker **AJ** AIRCRAFT CO.

1166 N. E. 31st Ave. Portland 12, Oregon



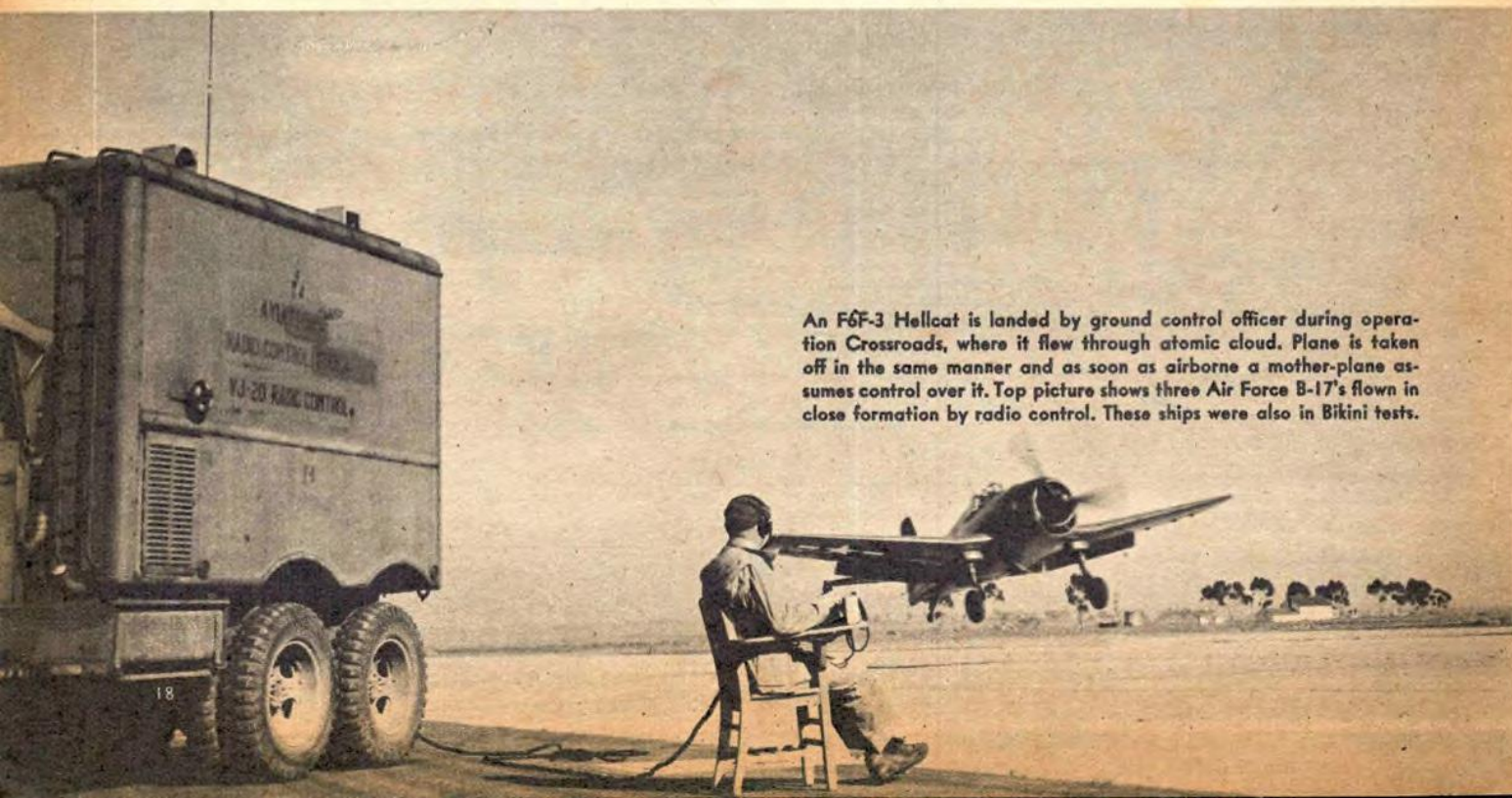
# PLANES

# without

# PILOTS



**They've been clay pigeons in gunnery practice, bombed Jap and German targets, and brought back data from the heart of Bikini's cloud. Uncle Sam's radio-controlled planes have missions in mind never remotely guessed at by Jules Verne.**



**An F6F-3 Hellcat is landed by ground control officer during operation Crossroads, where it flew through atomic cloud. Plane is taken off in the same manner and as soon as airborne a mother-plane assumes control over it. Top picture shows three Air Force B-17's flown in close formation by radio control. These ships were also in Bikini tests.**



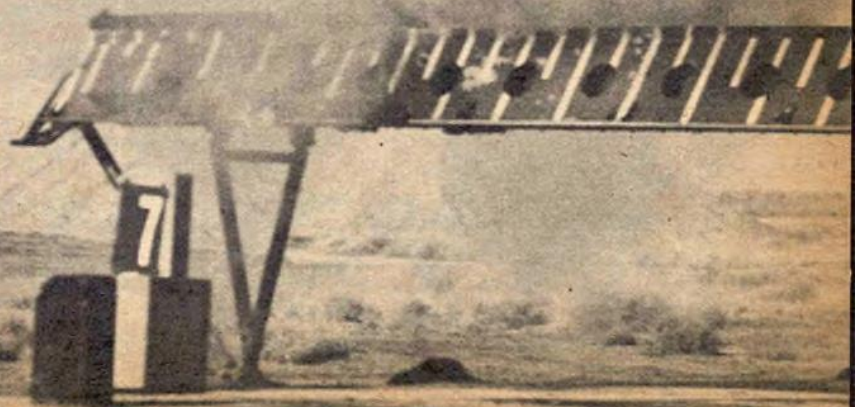
■ They call them "drones" or pilotless aircraft and they range in size from an overgrown model-plane to a multi-engine bomber. Their purpose is as varied as their size. Some serve as clay pigeons for gunnery practice; others, loaded with special instruments, have probed the heart of an atomic explosion and brought back valuable information otherwise inaccessible to human beings. These "planes without pilots" are remotely controlled by radio, from the ground, and mother-planes called "Queens." Since 1936, when the control of full-size airplanes by radio was first successful, they have contributed a major share in the development of guidance systems on which future push-button warfare depends. (Photos from Naval Aviation News.)



Above: An F6F drone guided by "Queen" plane, with a spare one on hand. Drones are usually painted red. Left: Drone control unit as used in F7F Tigercat mother-plane. Below: This TDR drone was the first pilotless bomber used in Pacific against Japs. Carried 2000-lb bombs.



OQ-19A Air Force target drone. This type is used for anti-aircraft target practice, is launched from a catapult and put through various maneuvers by radio control. This little plane is capable of a speed of 220 mph; a difficult target to hit. Parachute in fuselage, opened by radio signal, lands ship.





MARCH 1952 • 35 CENTS

# Air Trails

Aviation  
and  
**MODEL  
PLANES**



**USAF's TOP TEAM RACER • Scale CONSOLIDATED PB-2A**  
**He Flew 545 Motorless Miles to Beat the Russians!**



# AIR TRAILS

March  
1952  
Vol. 37, No. 6



Cover: Convertaplanes  
—Alfred Owles

## FOR THE READER

- 10 R/C Roundup—Howard G. McEntee
- 12 The C.A.P. Cadet
- 14 Airmen of Vision
- 16 Air Notes
- 17 Air Adventurers
- 19 Convertaplanes—Drawings by Alfred Owles
- 22 I Thermal Thumbed to Kansas—R. H. Johnson
- 24 Development Highlights
- 26 Famous Firsts in Aviation—Frank Tinsley
- 28 Lockheed F-94
- 29 AF Top Team Racer—Sgt. B. A. Thompson
- 32 Top 10 Model Men
- 34 Adding RPM to Piston Engines—Walton Hughes
- 36 Consolidated PB-2a—Walter A. Musciano
- 39 O-S-O-L-O-N-G—Henry Cole, Jr.
- 44 It Pays to Load "Em Up!—Dallas B. Sherman
- 45 Ehling's National Meet PAA-Load Winner
- 46 The Joisey Hoister—Ted Grzeszczak
- 48 Kit Preview: PAA-Master
- 49 Model Plane Forum
- 50 Wen-Mac Aerobat
- 50 Scientific Beechcraft
- 52 Dope Can—"Dopester"
- 58 Half-A Free Flight—Anthony D'Alessandro
- 60 Western Roundup—Dick Everett
- 64 Theory in Profile—Wally Fromm
- 66 Safety Fuse—Hal Roth
- 68 Foreign News Notes—Drawings by Thomas
- 70 Swedish 'Copter—C. G. Ahremark
- 76 Showcase

## THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

**Editor:** Albert L. Lewis. **Technical Editor:** Alexis Dawydoff. **Editorial Production:** Carl Happel. **Art Director:** W. F. Tyler. **Editorial Assistants:** Rose Borello and Rosalba Accardi. **Special Correspondents—Washington:** Kendall K. Hoyt; **West Coast Modeling:** Dick Everett.

### STREET & SMITH PUBLICATIONS, INC.

**President:** Gerald H. Smith  
**Executive Vice President:** Ralph R. Whittaker, Jr.  
**Vice President and Secretary:** Arthur P. Lawler  
**Treasurer:** Thomas H. Kaiser

**Walter J. McBride, Advertising Mgr.,** 575 Madison Ave., New York 22; **Frank C. Smith, Mid-Western Adv. Mgr.,** 230 No. Michigan Ave., Chicago 1; **West Coast Advertising Representative, Kimball, Menne Co.,** 1052 W. 6th St., Los Angeles 17, California.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada, Copyright, 1952, by Street & Smith Publications, Inc. 35c per copy—\$3.50 per year, \$7.00 per year in countries of the Pan-American Union; \$4.50 per year in Canada; \$10.00 per year elsewhere. This issue is Vol. XXXVII, No. 6. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**To Get AT Annual by Mail . . .** You did a swell job on the 1951 Annual. Just a suggestion: Why don't you grant regular subscribers the privilege of obtaining a copy by mail? I had quite a task obtaining mine, as I did not want to miss it.

Wallace Bishop, West Haven, Conn.

• We have news for you, Wallace. The 1952 Air Trails Model Annual, which goes on sale early in February on newsstands and in hobby shops, may be obtained by mail by sending in the regular price of 50¢ (60¢ if you live in Canada, \$1 if elsewhere in the world) to Air Trails, 304 East 45th St., New York 17, N. Y. This means anyone, whether a subscriber or not. Those sending in the price along with their name and address (please print) before the sale date will have copies reserved for them and then mailed at publication time.

**Correction on Long Midget . . .** Your article with photographs titled "Speed Merchants" was very interesting. However, I do believe that false credit should not be given for promotional reasons. The complete plans, jigs, and templates and manufacturing rights of the Long Midget are owned by me, and we are willing to build Midgets upon order. Also, to the best of my knowledge, Curtis Pitts built #9, which is owned by Luther Johnson.

F. A. Torrey, M.D., Plano, Ill.

**"Will It Fly?" . . .** A friend of mine and I have spent the evening discussing model building and looking through current issues of Air Trails. The general sort of model that seems to be selling, as advertised in your pages, and flying, as presented in your articles, is a far cry from the Good Olde Days when Bill Barnes and his Lancer appeared in every issue of AT. Carl Goldberg was winning rubber-power contests with a gasoline-motor model, and the twin pusher was still a reality.

We have managed, without, I may add, much difficulty, to resist the Pre-Fabricated Build-It-In-Ten-Minutes swing-on-a-string "contemporary school." We are still in the dark ages; i.e., we enjoy building detailed solid scale models of ships from the First World War and the period of fifteen years afterward, with an occasional venture into original design sport free-flight and gliders. Our question is this: are we members of a vanishing race; breathe there a soul who still thinks model building should combine art and science, instead of demanding an ability to bolt a motor to a few pieces of assorted hardwood and swing it on a wire? What happened to the hardy souls who used to labor bending bamboo wingtips over a candle-flame? Have they all been won over to monkey-on-a-stick modernism? Doesn't anyone ask any more, "Will it fly?" rather than "How fast will it go?"

Sound the tocsin; raise the drawbridge; to arms! If there remain a few fellow sufferers who remember the days of 1/20" sheet balsa and Ambroid let them be heard, let them join us in our plea for a return to model-aircraft sanity, for learning the hobby the hard and only way, for liberation from the Frankenstein's Monster of Just As-

semble and Fly! O tempora!

R. B. Childs, Department of English,  
Stanford University, California

**For the Flying Pencil? . . .** Recently my brother, Peter (age 11) bought a model plane engine and took it to school to show his friends. It caused quite a sensation, of course. But I thought the reaction of one of the girls might interest you . . . she thought the engine was a pencil sharpener!

David Bredemeier, East Aurora, N. Y.

**Ford Trimotors Still Active . . .** As a constant reader of your magazine I wish to correct you on one thing. This being where you state and I quote: "That the Northrop C-125 Raider as being the only three- (3) engine aircraft in the USA. Raider was designed for small-field operations to act as a cargo and rescue plane. It is basically an assault transport and is slated for Arctic service." The reason that I do this is because we have at the "Johnson Flying Service" one if not two or three old Ford Trimotors, which are still in service for the Forest Service in and around Missoula and vicinity. These planes are used to carry "Smoke Jumpers" and their supplies to forest fires very effectively in this brand of fire fighting.

Terry Evans, Missoula, Mont.

**Internats Mystery Stunter . . .** I notice with interest that, through Dope Can, Philip Paul of Buenos Aires is trying to locate the builder of a particular stunt model which was present at the '49 Internats.

The model he described is, I believe, one that I shall never forget. It was, as Phil said, something over five feet, and resembled a Madman. It was orange with black trim and had a screaming Orwick up front.

We watched the owner practice the day before the event, and never have I seen such flying. The ship would "coast" through two-thirds of a "clover" after the engine died—and then it would glide a couple of laps before landing! (Without whipping, that is!)

We were so impressed with the flying that we became acquainted with the owner. We even helped him put it back together after his first official had ended in a crack-up. He admitted that he liked to fly for the spectators, and that his low pull-outs were his downfall. He had been coming out of his maneuvers in the grass right along, but on one of his final maneuvers he dug his wheels in a bit too hard, and the great speed of the ship ripped out the gear, along with a good portion of the fuselage.

(Continued on page 8)

### NOTICE TO SUBSCRIBERS

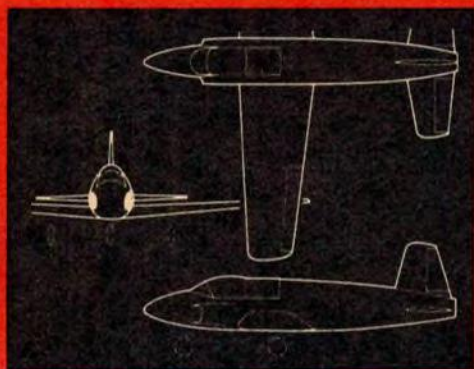
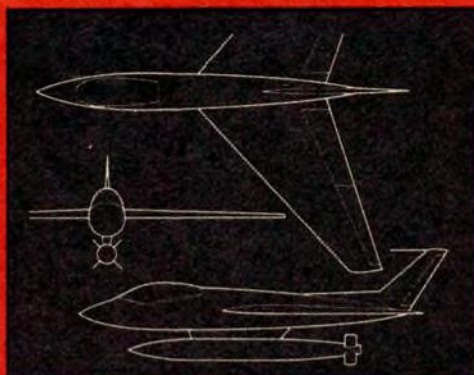
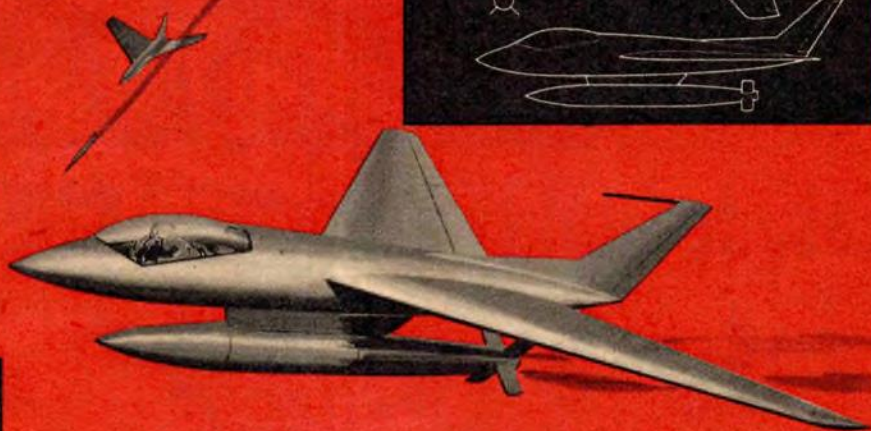
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



# Airmen of Vision

## DESIGN COMPETITION

This month's best. Defense Interceptor by Pfc. Richard Locher of Kelly AFB, Texas. Plane is catapulted from ramp using Jato cart. Motive power in flight supplied by the rocket attached below. Part of fuel is carried in plane. When enemy is intercepted the rocket is launched, plane itself returning to base as glider. Craft is actually alarm fighter, can be launched at steep angle; chiefly protects own base.



Two-place jet trainer by Jan Thyllen of Norrköping, Sweden. Is powered by a fairly small turbo-jet developing only 2500 lbs. of thrust. Its purpose is to familiarize pilots with operation of jet aircraft. General shape similar to British fighters. A good simple straightforward design. Span is 31 feet, length 25 feet.



Low-cost, single-place lightplane by Walter Winberg of Chatham, Canada. Symmetrical wing panels are interchangeable. Externally ribbed wing skin is riveted to aluminum skin; stabilizer is of same construction. Fuselage forward of trailing edge is metal clad, remainder, fabric covered. Wingspan 25 feet, length 16 feet; gross weight 500 lbs. A 35 hp engine; top speed 95 mph, landing speed 35 mph. Landing gear Cessna type. Especially notable is fine visibility.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

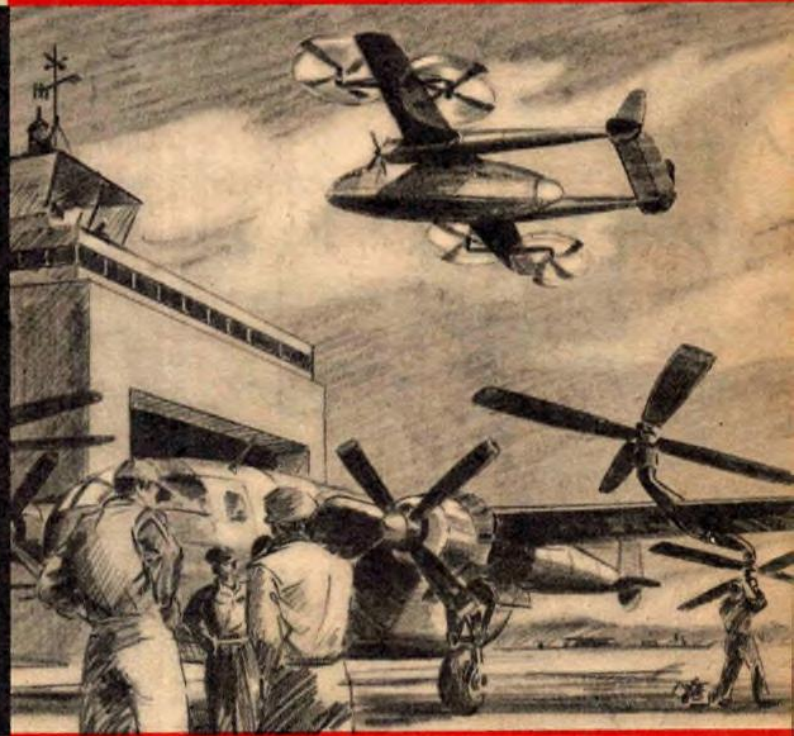


**Convertaplane, a blend of helicopter and airplane, when fully developed will give us aircraft with ideal flight characteristics**

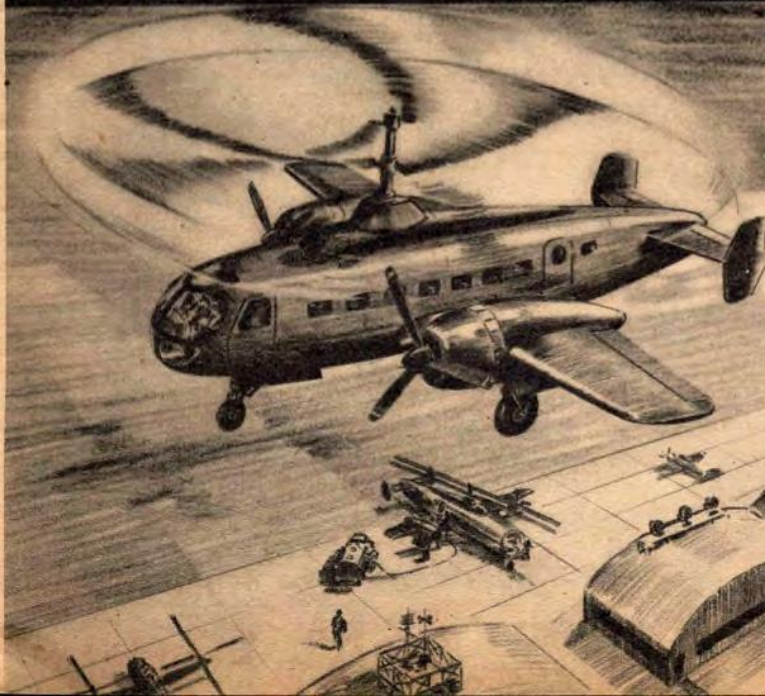
Three-bladed "stop rotor" design (left). On the ground fuselage is vertical. While rotors are in horizontal plane, rotation is by means of propellers on leading edges. After craft has risen vertically, fuselage assumes horizontal position, rotors are feathered to function as wings, while propellers furnish forward thrust. Jet engines can "sub" for propellers.

CONVERT  
PLANES

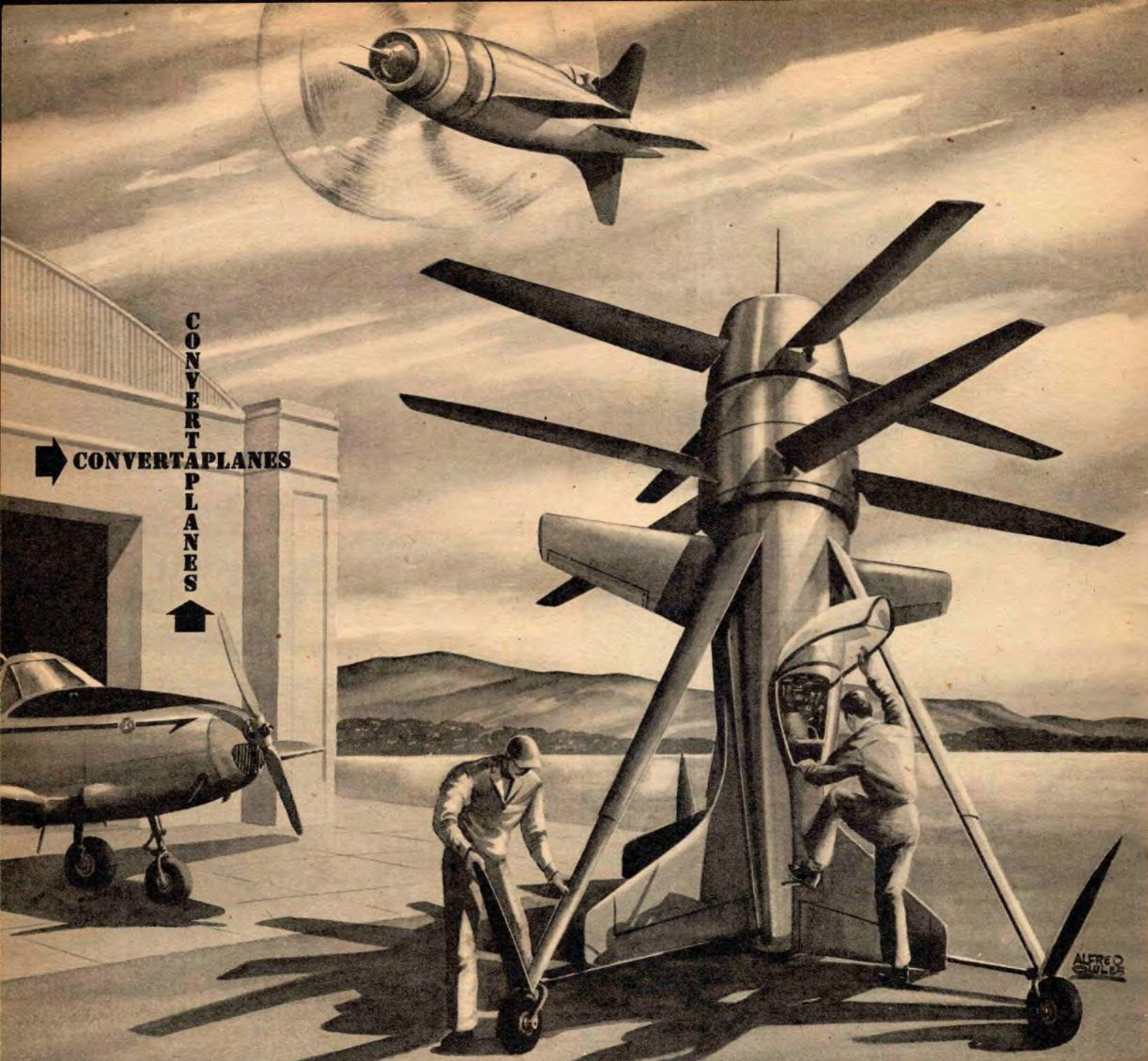
CONVERTAPLANES



Flettner convertaplane (above) is conventional type aircraft with addition of lifting rotors located ahead of leading edge and behind trailing edge of wing, to overcome downwash interference of fixed-wing rotors. In level flight each rotor can be turned parallel to flight direction, offering least drag. Left: This type is already in experimental stage. In U.S.A. by Gyrodyne Co. of America; by Fairey Aviation in England. Known as "unloaded rotor" design, blades are power driven during take-off, landing and hovering flight, free wheel in cruising flight.







Tilting fuselage convertaplane with tractor rotors acting as propellers when craft is in horizontal flight. This is an early concept.

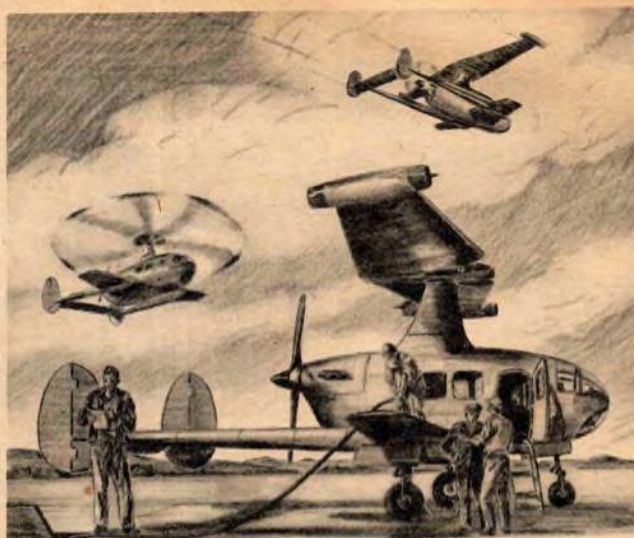
■ The convertaplane, theoretically, is an ideal flying machine since it combines the best features of a helicopter with that of fixed-wing aircraft. It can rise and descend vertically, hover motionless in the air, and yet, unlike the helicopter, possess the high speed and load-carrying capacity of the conventional airplane. It is no wonder, therefore, that the world of aviation has been working overtime to produce a practical convertaplane. These interesting designs were discussed and suggested during the First Convertible Aircraft Congress by leading engineers of vertical lift aircraft. The fact that three major aircraft concerns, Bell, Sikorsky and McDonnell have been granted experimental contracts by the military for development of convertaplanes is a sure indication

that a stage well beyond paper doodling has been reached. It will be several years before we see the convertaplane even in small scale operation, and the military will have first call on it, but that is just as well. Military use of helicopters greatly accelerated their practicability and public acceptance. Lawrence D. Bell of Bell Aircraft Corp. has stated, "The helicopter's contribution in Korea has cut ten years off the aviation industry's time schedule for development and recognition of the craft." Los Angeles Airways has been successfully operating helicopters for a couple of years and New York Airways was recently authorized to conduct helicopter operation in New York Area. The convertaplane is slated to follow the same road to success.



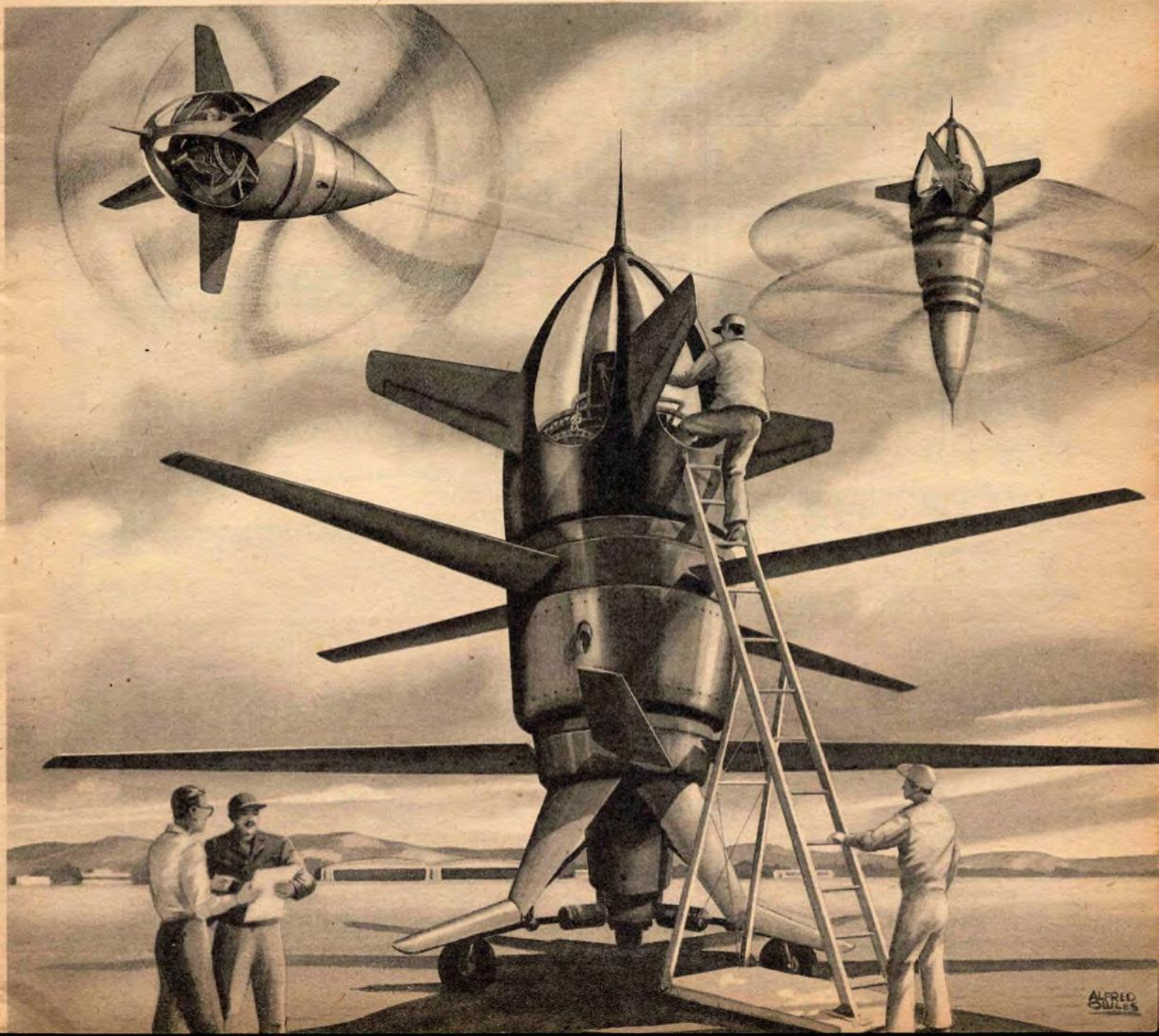


Zimmerman's design development of original craft built by Chance Vought in '46. Flew well as conventional plane, landed in short space.



Herrick HC-6D. Top surface acts as jet-driven rotor, can be locked to act as wing. Herrick had similar plane flying 20 years ago.

Tilting fuselage convertaplane with mid-fuselage rotor. The placement of the control surfaces above center of gravity increases stability.







Custer Channel Wing airplane recently demonstrated to press at Pittsburgh, Pa. Taylorcraft Inc. licensed to build military liaison plane based on this principle.

Below: Kaman K-225 turbine powered helicopter, built under Navy contract. Has Boeing 502-2 gas turbine of 175 hp. Entire powerplant weighs less than 250 lbs.

## Development Highlights



Gloster GA5, world's first operational twin-jet Delta fighter, for all-weather day and night duty. Two Armstrong Siddeley Sapphires of 7200 lbs. thrust each.







Fletcher armed lightplane. An experimental version. Note racks under wings for bombs or rockets; also armed with .30 cal. m.g.'s in wings. 250 hp engine.

Below: de Havilland Chipmunk, product of de Havilland Co. of Canada. Used by RAF and RCAF for training. This model is powered by 190 hp Lycoming engine.



Auster B4, British ambulance-freighter lightplane. Loading is through rear section of pod-fuselage. Wingspan 37 ft., engine 180 hp Cirrus Bombardier, speed 100 mph.





# FAMOUS FIRSTS IN AVIATION

*It's no easy matter to pick the most significant planes of all time—but consider Tinsley's Trailblazers!*

By FRANK TINSLEY

■ When one considers the thousands of novel and interesting crates that have burdened the progress of aviation's five frenzied decades, the task of picking out the ten most significant is an enormous one. The only way out seems to lie in selecting a series of prototypes, each of which fathered a completely new school of design. By dint of much delving, we come up with the following assortment. Some are familiar, others obscure.

The first milestone on the rocky road of air progress is the final Wright Brothers' glider of 1902. Although many other glider designs antedated it—Lilienthal: 1891; Pilcher: 1895; Chanute and Herring: 1896—catch-as-catch-can layout and rule-of-thumb aerodynamics proved frequently faulty. It was the Wrights who really pioneered the scientific approach to flying. They built and used the first wind tunnel and were the first to evolve the correct principles of air-flow and lift. Their culminating glider, a well-engineered biplane of 32 ft. span



Wright  
glider  
(1902)

and 5 ft. chord, was strong, stable and controllable in flight. It established the basic form of aircraft for the succeeding two decades and can truly be called the granddaddy of modern aviation.

The next great forward step in aircraft design was the elimination of the strut-and-wire "built-in headwind." Generally

credited to Tony Fokker, with his "Flying Razor" and later collaboration with Junkers, the internally stressed, monoplane wing was really pioneered by the great French designer, Levasseur. As early as 1911 he came up with a low-wing, cantilever monoplane. His Antoinette of that year boasted a buried 90 hp fuel-injection engine, completely covered fuselage and tandem wheel landing gear enclosed in streamlined spats! It was not until twenty-odd years later that



Antoinette  
cantilever  
(1911)

Northrop resurrected the layout with his 700 hp Delta and Gamma models.

Our third milestone switches the path of aerial progress off on a tangent. It appeared in 1914 and was the fruit of an international collaboration between the American designer, Burgess, and an original-minded English experimenter named Dunne. Between them, they produced the first practical tailless plane. Built with both wheel and float gear, their V-shaped biplane was completely stable and easy to fly. It sported a rear engine, pusher prop and wingtip floats.

The Burgess-Dunne Tailless was one of the U. S. Navy's earliest service seaplanes. Why it was eventually discarded is one of the murky mysteries of aircraft procurement. It was later followed by a long line of distinguished descendants, among them the Westland-Hill "Pterodactyls," Horten's gliders, Waterman's roadable "Arrowbile," the Northrop series

of flying wings and the present English and Canadian models. It was the true progenitor of the tailless flying wing.

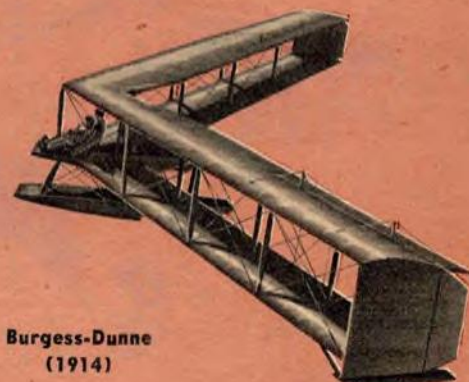
Another and even more radical offshoot was the concept of a brilliant young Spanish designer named Juan de la Cierva. After several crashes, he became disgusted with the poor landing characteristics of his conventional planes, and tackled the apparently insoluble problem of keeping the wing flying fast while the plane to which it was attached, landed slow.

His agile mind hit on the idea of rotating the wings and the autogiro was born. In this machine, the usual fixed lifting surfaces were replaced by a set of narrow, pinwheel-like wings which whirled around a central hub. The "rotor," as it was called, could thus spin at flying speed even while its fuselage hung motionless in the air. Rotor speed was maintained by the natural force of autorotation and the ship propelled independently by a standard engine-driven prop in the nose.

The early designs were not too practical. Endless taxiing was necessary to get the rotors turning at flying speed. Then, Cierva incorporated an auxiliary drive shaft from the engine to start the rotor promptly. One improvement followed another until autorotation was finally abandoned and direct engine-driven rotors substituted. Thus, the whole descendant line of modern helicopters and convertiplanes harks back to Cierva's original whirligig grasshopper.

The next milestone was unveiled when I crawled out of an old, two-passenger "40" at Boeing field early in 1930. Out of the hangar doors was wheeled a gleaming apparition that made my eyes pop. It was the prototype "Monomail," a slender bodied, polished aluminum monoplane that was to spark a new era in air transport. Designed to replace the biplane "40" in the carriage of mail and passengers, the new beauty still clung to the fixed landing gear and open pilot's cockpit. Everything else about it, though, was a dream of modernity and a promise of things to come.

The promise was not long in bearing fruit. From the Monomail sprung the first modern bomber, the YB-9. It was the father of the Boeing 247 twin-



Burgess-Dunne  
(1914)





**Cierva  
(1923)**

engined transport and through it the great granddaddy of all our American low-wing, multi-engine, transport designs. A true trailblazer!

Now we jump to the war years and the birth of postwar aviation. It is August, 1939, on a well-guarded experimental base in Hitler's heartland. Taking the air for the first time is a sleek, strange-appearing, shoulder-wing monoplane. The strangeness comes from its truncated nose which gapes like the open maw of a shark. As the new ship taxis down the runway with a peculiar whining roar, we see that the tail cone has been chopped off, too. From this horizontal "stovepipe" comes a blast of shimmering heat and the whiff of burning kerosene. It is a new, hush-hush prototype of Heinkel's, the He-178—the world's first flyable jet plane! From this almost unknown have come the basic design principles of all our modern jet engines and



**Monomail  
(1930)**

planes. It is without question the father of the jet age.

It is but a short step to our next milestone of aviation. Another age-old medium of propulsion has been reharnessed by modern technology. Back in the time of the Ming Dynasty, the rocket was known and used in both peace and war. Now, charged with potent liquid chemicals instead of crude Chinese saltpeter, and with the complicated plumbing of the Walter engine replacing the cone-shaped charge of black powder, rocket propulsion had assumed a new and more usable form.

The plane in which this potent scientific Genie is imprisoned is short, stubby, with broad, swept-back wings and a skid-like landing skid. It is the Me-163, first service interceptor to be powered by a rocket engine and a deadly aerial weapon that may easily destroy America's Flying Fortress fleets. But time and production are operating against the new skyrocket. Instead of winning a bad war, it now occupies a more honored niche in history

—it is the ancestor of the dawning age of rocket power.

About the same time, another departure from the trunk line of aviation history is being switched off the main tracks at Peenemunde. Fitted with a larger and still more powerful rocket plant, the slim, pencil-pointed form of the V-2 missile is emerging from its scientific cocoon. Until its bases in northern France and the Low Countries are finally overrun, it brings madly roaring death and destruction to England's crowded cities. Here is something new—the first practical realization of an old and terrible dream.

Plunging vertically from the sky in



**He-178  
(1939)**

split-second menace, it is mankind's first bitter taste of space warfare. Although not a controllable missile in the present sense, or as ingeniously complicated as today's big sky borers, Von Braun's V-2 is nevertheless the potent parent of an era still in swaddling clothes—the age of space travel!

Now, the actual fighting is over. Back on the main tracks again, we approach a more scientific milestone. Spurred on by the wartime development of the gas turbine and rocket engine, man is ready to tackle the unknown menace of the sonic barrier. Like the direful prophets of old, modern Jeremiahs had long



**Me-163B  
(1944)**

warned of the dread shock waves of air's incompressibility. These waves could wrench the wings from any plane built—tear it apart!

Undeterred by such doleful theories, questing minds went bravely ahead. They had the power, now. All that was needed was an airframe in which to apply it. Bell engineers tore into the problem and came up with the airplane. Reaction Motors built the compact, powerful, four-

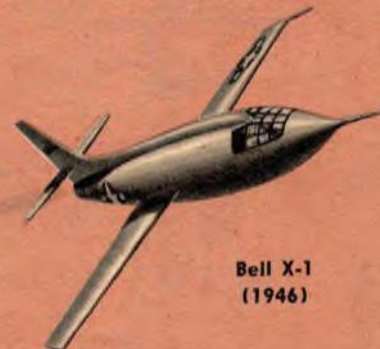
burner rocket engine.

An Air Force pilot kicked in with the courage and skill. So, one day over Muroc, the needle-nosed X-1 was borne aloft, released at altitude and the speed of sound was achieved and passed! Larry Bell's little bullet had crashed the barrier, made aeronautical history and ushered in the age of supersonics!

Our final milestone looms ahead. Although not yet reached at this writing, it stands clearly revealed in the immediate future. The most secret of Uncle Sam's laboratories have been involved in this one and now they are slowly inching aside the security curtain. Soon they will unveil their Herculean baby. The prototype powerplants near completion. Contracts have been let and work started on a monster airframe to house the monster power. The keel has been laid and the ship is on the ways.



**V-2  
(1944)**



**Bell X-1  
(1946)**

In a matter of months it will be launched and with it, all bonds of duration will be severed. Subject only to the limitations of metals and materials, the frailty of flesh and blood, flight can go on forever.

The day of atomic power is at hand!

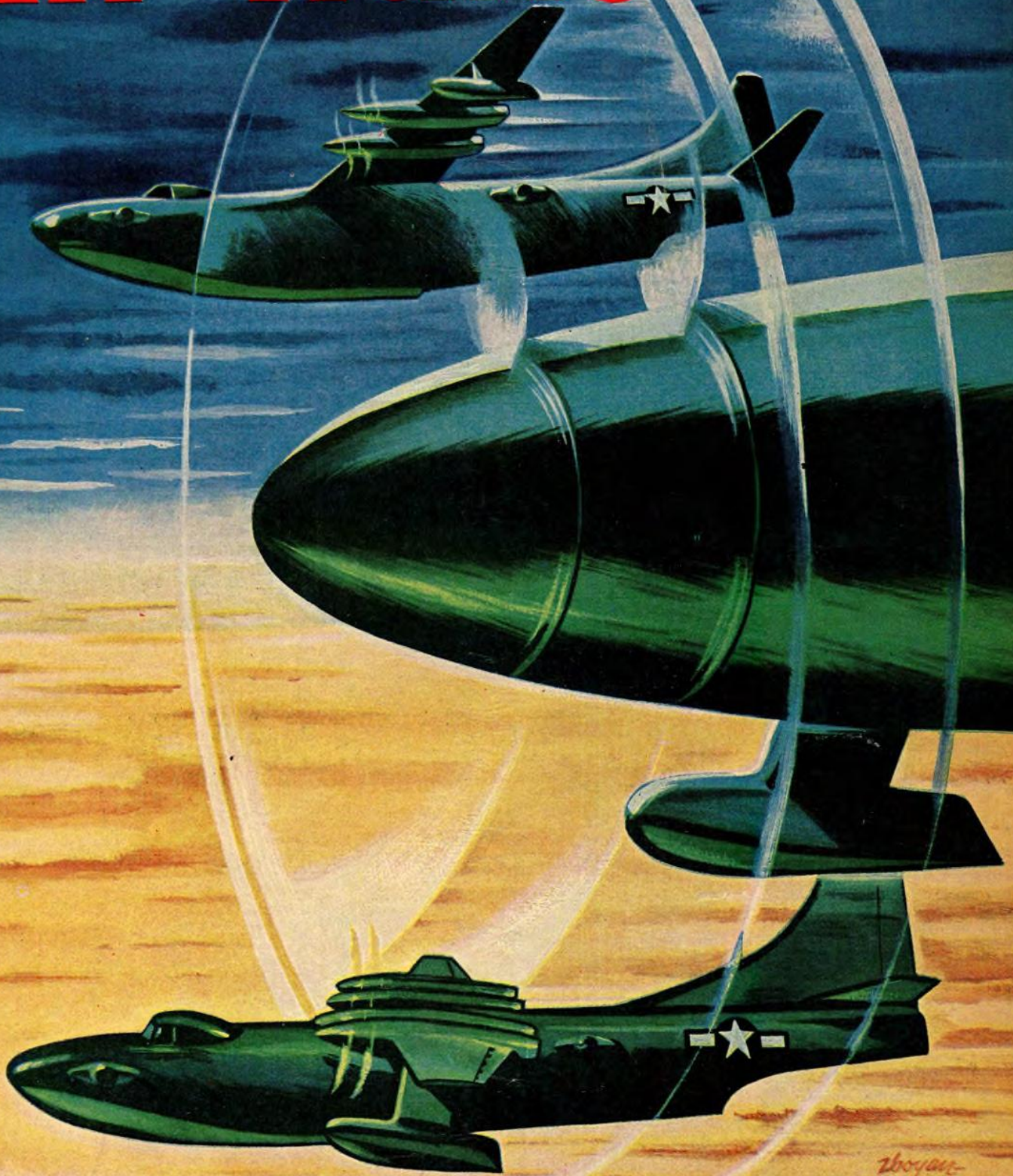
But let's take one more quick glance at the "milestones" already passed. We are struck by two things—the time made and the terrain covered during aviation's monumental march into the unknown. Surely no other phase of man's mechanical invention through all the centuries has conquered so much important ground in so short a span of years!





APRIL 1952 • 35 CENTS

# Air Trails



Hall-Massey Speed Models • Still's Stunt "Stuka" • Thomas-Morse Biplane



# AIR TRAILS

April  
1952  
Vol. 38, No. 1



Cover: R3Y-1  
Transports—by Zbayan

## THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

**Editor:** Albert L. Lewis. **Technical Editor:** Alexis Dawydoff. **Editorial Production:** Carl Happel. **Art Director:** W. F. Tyler. **Editorial Assistants:** Rose Borello and Rosalba Accardi. **Special Correspondents—Washington:** Kendall K. Hoyt; **West Coast Modeling:** Dick Everett.

### STREET & SMITH PUBLICATIONS, INC.

President.....Gerald H. Smith  
Executive Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 1052 W. 6th St., Los Angeles 17, California.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada, Copyright, 1952, by Street & Smith Publications, Inc. 35¢ per copy—\$3.50 per year, \$7.00 per year in countries of the Pan-American Union; \$4.50 per year in Canada; \$10.00 per year elsewhere. This issue is Vol. XXXVIII, No. 1. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to: Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FOR THE READER

- 10 Civil Air Patrol News
- 12 R/C Roundup—Howard G. McEntee
- 13 Air Notes
- 14 Airmen of Vision
- 16 Air Adventurers Club
- 19 First Flying Saucers
- 22 The Open Cockpit Era—  
Donald Naughton & Henry Schindall
- 26 Germany's Most Famous Fighter—  
Douglas Rolfe
- 28 Still's Stick Stunt "Stuka"—Don Still
- 32 Model Builders Are Inventors Too!
- 34 Model Matters
- 36 Golden Rods—Pat Massey & Carl Hall
- 40 Baby Biwinger—Lud Kading
- 44 "Tommy" Scout—Walton Hughes
- 48 Model Plane Forum
- 49 New Aircraft in 3-View Form—  
Björn Karlström
- 50 Sterling's Ringmaster
- 50 Consolidated's Starlet
- 51 Beep Box for Radio Control—  
Howard G. McEntee
- 54 Dope Can—"Dopester"
- 56 Flying Profiler—P-38 Lightning—  
H. A. Thomas
- 58 Western Roundup—Dick Everett
- 66 Sketchbook—Drawings by Thomas
- 72 Like Father . . . Like Son
- 76 Showcase
- 81 Last Word

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**We Credit Major Schwartz . . .** We here at Boeing were all very much pleased with that swell cover shot on the February issue. However, we were a little embarrassed inasmuch as the picture you used appears to be taken by Major Phil Schwartz, who is on the staff of the Commander, Pacific Division, MATS. Major Schwartz, who not only is one of our very best friends but also is a top Air Force public relations officer, doubles in brass with a camera and also finds time to fly the MATS route to and from Tokyo every few weeks. I wish there was some way you could give him proper credit for that cover as I know he would greatly appreciate it.

Gordon S. Williams, Assistant Manager,  
News Bureau, Boeing Airplane Co.

**AMA Scale Plans Rule . . .** Some time ago I wrote to you regarding the plans for the Fleet Biplane and the Spirit of St. Louis as appearing in Air Trails. At Detroit the Spirit of St. Louis was accepted and full points given but the Fleet was not. In your answer to me you told me that both plans were "extremely accurate." I have finally got an answer from AMA, and they point out the rule on page 69 of the rule book, which I will not again quote here. There is no doubt about it that the rule is misleading in connection with "3-views." However, AMA tells me that working plans are acceptable if there is a note to the effect that such plans have been checked and found accurate.

Now would you please do me a favor and more than likely all the scale model builders across the country, the contest directors, and all scale model judges. This is it: Publish a line or two on scale models you have published in the last year or two that have been checked as accurate; also in future issues, all scale models plans should be noted as worthy of passing AMA judges. That is all there is to it.

Arthur J. May, Bismarck, N. D.

● Note to all contest directors: The flying scale model plans in Air Trails are checked with authoritative sources and are considered by the editors to be completely accurate.

**French Mid-jet Engine . . .** In a recent issue you had a short article on the new possibilities of Mid-jet Racers. In this it was mentioned that Continental Motors Corp. has acquired manufacturing rights for the French-Palms mid-jet engine.

My partner and I would appreciate it very much if you could send us the proper address of Continental connected with this project.

Cpl. Ernest R. Marker, Jr., Briggs AFB, Tex.

● The Turbomeca jet engines will be built by Continental Motors Corp., 1500 Algonquin Ave., Detroit 14, Mich.

**Suggestion for Afterburner . . .** I have an idea that I would like to know if it is feasible. Could an "afterburner" be added to the exhaust of a piston engine? A spray of fuel could be injected into the exhaust and ignited by the hot gases. For take-off, etc.

John Ruby, Aurora, Ill.

● Your idea is not practical as gain in power will not be sufficient to overcome very high fuel consumption.

**Aircomet in WW II . . .** Were the P-59 Aircomet and P-80 Shooting Star used in actual combat in World War II or not?

Marvin Schneider, Weimar, Tex.

● Neither the P-59 nor the F-80 were ever used in actual combat, though a couple of F-80's were sent to Europe toward the end of the war for demonstration purposes.

**Gloster Meteor Record . . .** Back in your December 1951 issue you stated in the article "World's Leading Airplanes" that the Gloster Meteor 8 is a "descendant of the first Allied jet fighter to see active service in World War II." Now I think I can say that your information would be reliable. However, the Reader's Digest (another magazine which is usually reliable) in a previous edition stated that the German Air Force had the only operational jet planes in the world until after the end of World War II.

The article stated that there were Allied jets such as the Meteor and the Aircomet, but that they never saw combat as did, for instance, the Messerschmitt Me. 262A-1. Who's right?

I have one other question. I have been told that the prototype design of the F-51 Mustang was purchased by North American Aviation from Willy Messerschmitt in the Thirties. True?

William L. Farrar, East St. Louis, Ill.

● Although there is no record of the Gloster Meteor having ever engaged in a battle with German aircraft, according to 1945-46 edition of the British authoritative "Jane's All the World's Aircraft": "The Meteor has the distinction of being the only Allied jet airplane to go into operational service in World War II. The Meteor first flew in March 1943, and it shot down its first German V-1 flying bomb on August 14, 1944. After being in action against the flying bombs from bases in South England, the Meteor went overseas and served with 2nd Tactical Air Force in Northern Europe."

The P-51 Mustang design was never purchased by North American from Messerschmitt. It is their own design.

**Me 109A-B-C-D??? . . .** Looking through my collection of material on German aircraft I am unable to find anything on the Me. 109 prior to the "E" model. What happened to the A, B, C and D versions?

Harold Johnson, Ft. Worth, Tex.

(Continued on page 8)

### NOTICE TO SUBSCRIBERS

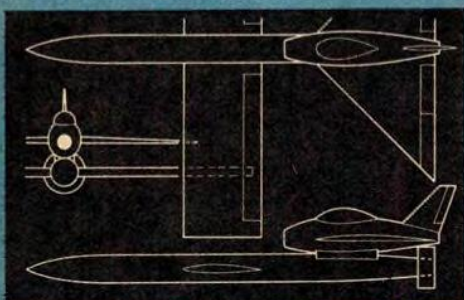
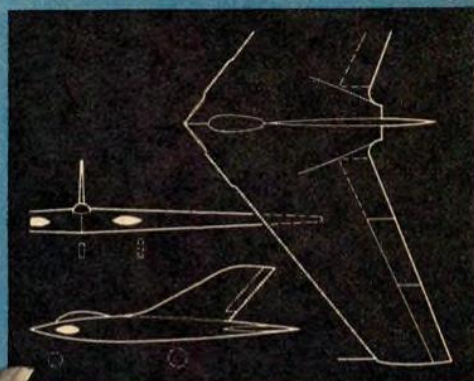
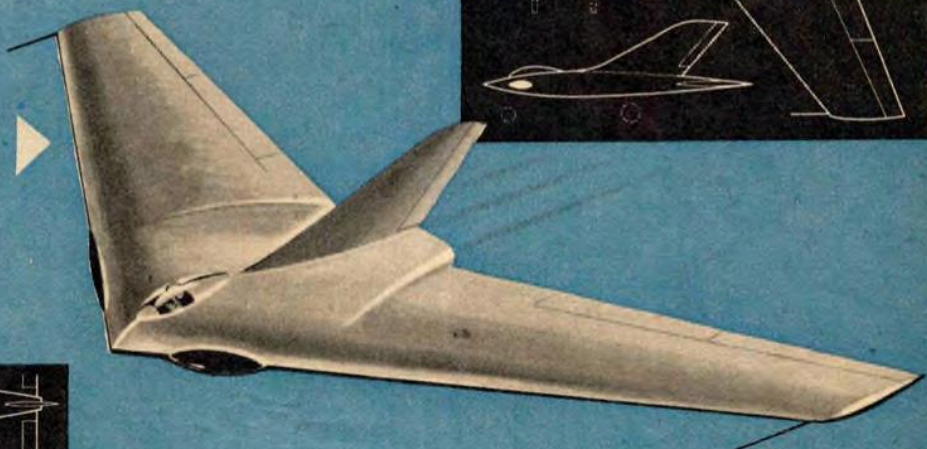
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



# Airmen of Vision

## DESIGN COMPETITION

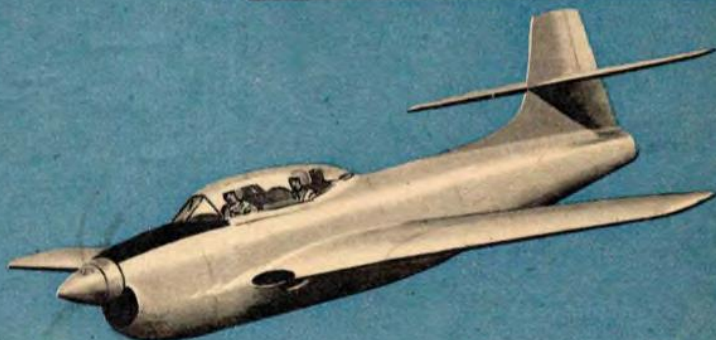
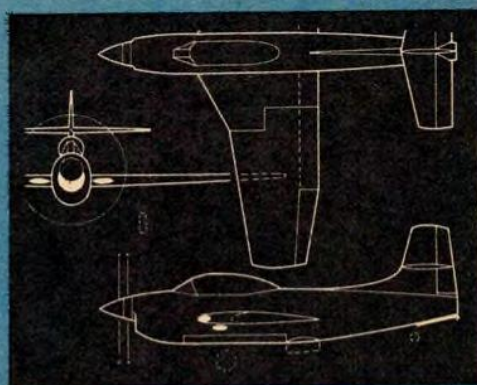
Judged as the best design of the month, this fast-climbing interceptor is the work of Eugene Gravelle of Masury, Ohio. It is powered by two 20,000 lbs. thrust jet engines which give a rate of climb of 12,000 ft. per minute. Pilot entrance is through a hatch in plane's belly in order to obtain unbroken line of canopy, which is jettisonable in case of emergency. Plane is not unlike the German Lippisch P-11 Delta wing.



Turbo-prop-jet submarine killer by Stuart Kester of Grant's Pass, Ore. Plane is designed to operate from carrier. Has two engines, one behind pilot driving one prop through long shaft, the other in nose connected to the second prop. Bombs and depth charges are stowed in bomb bay. Has four 20 mm cannon in wings, m.g.'s in rear.



Giant air-to-ground guided missile by Pfc. Herbert Beaujon of Andrews AFB, Washington, D. C. This interesting project consists of a 45-ft. guided missile astride of which rides a piloted jet fighter. The combination is launched from a ramp with guiding toward target done by pilot in fighter. Upon reaching target, missile is aimed at it and released from fighter, special devices keeping it in line with target. Designer claims device cheaper than bombers.

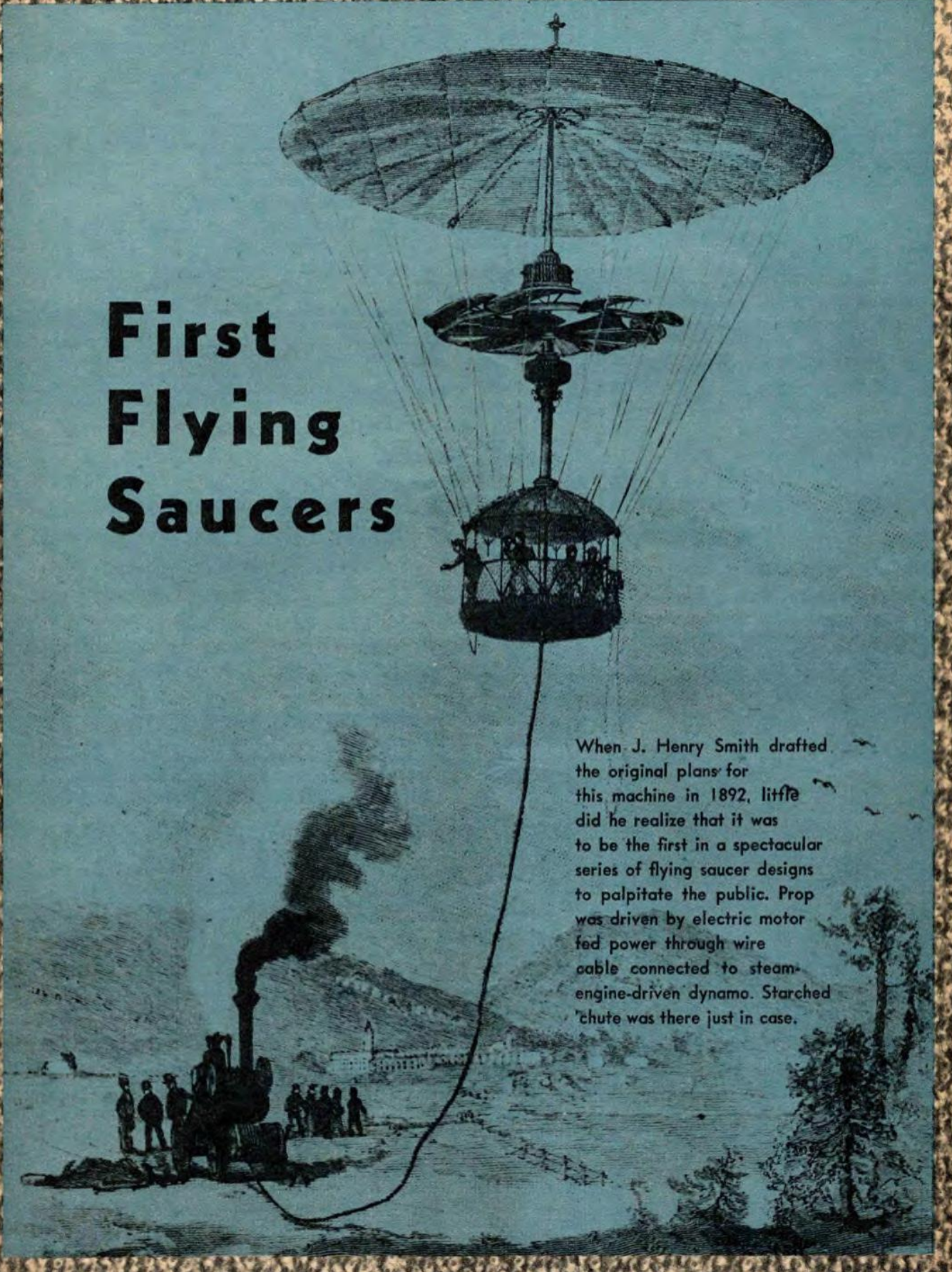


Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

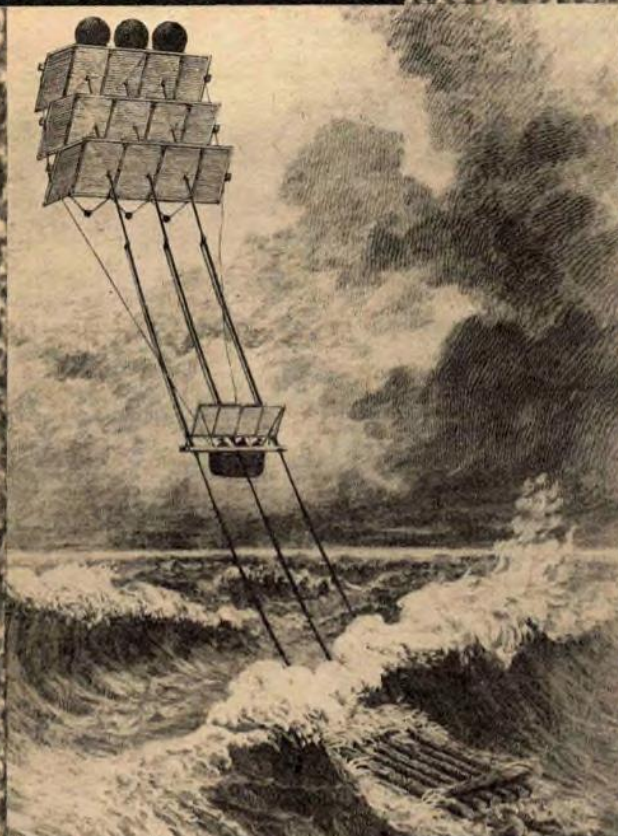


# First Flying Saucers

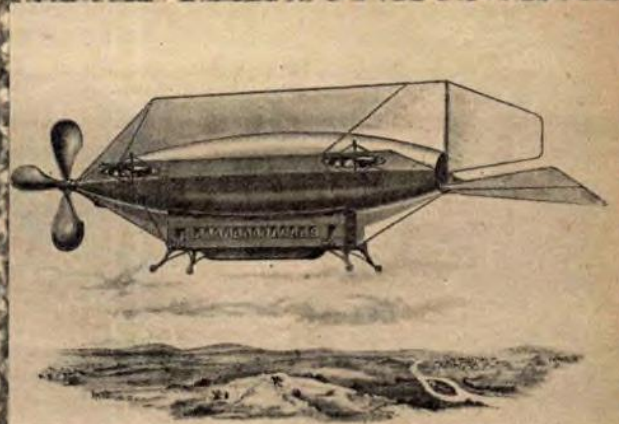


When J. Henry Smith drafted the original plans for this machine in 1892, little did he realize that it was to be the first in a spectacular series of flying saucer designs to palpitate the public. Prop was driven by electric motor fed power through wire cable connected to steam-engine-driven dynamo. Starched 'chute was there just in case.





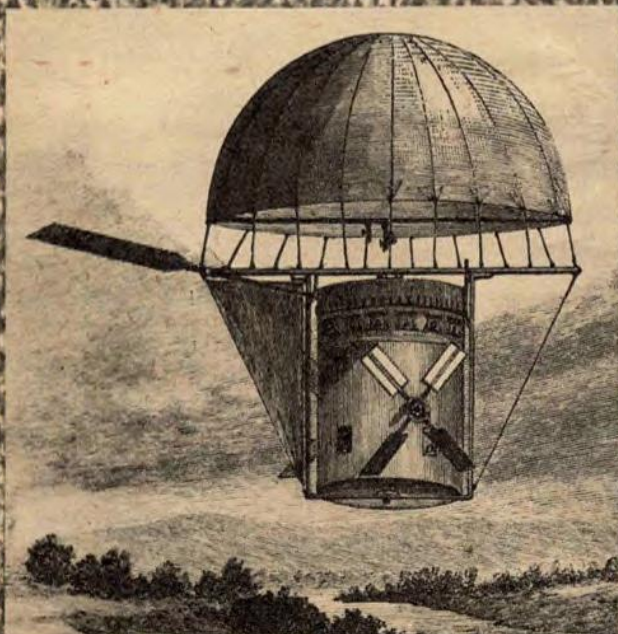
Inventor-Doctor David Thayer of Boston, Mass., styles this apparatus an "aerial railway." Its purpose is to tow vessels and vehicles by virtue of kite and balloon combination. Results not released to date.



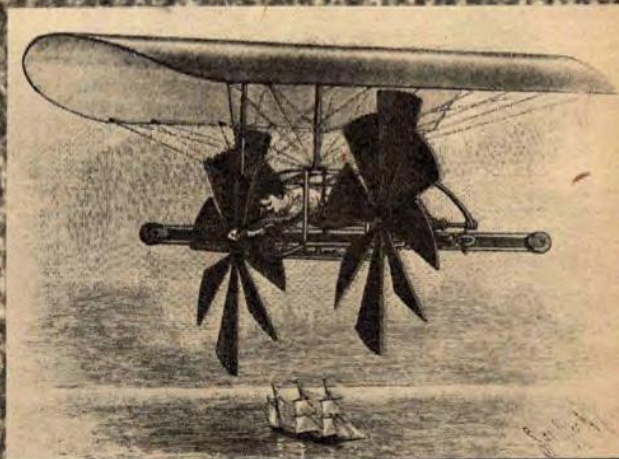
E. J. Pennington of Mt. Carmel, Ill. in 1891 hit on the solution to make flying machine reliable: large sail on gas bag propelled ship if engine failed, props in wing for vertical ascent, descent. All-aluminum!



Cheap power and lack of fire danger was the goal of New York's A. J. Rieckert who in 1889 dreamed up this fantastic dirigible with flapping wings actuated by a two-man-power bicycle arrangement.

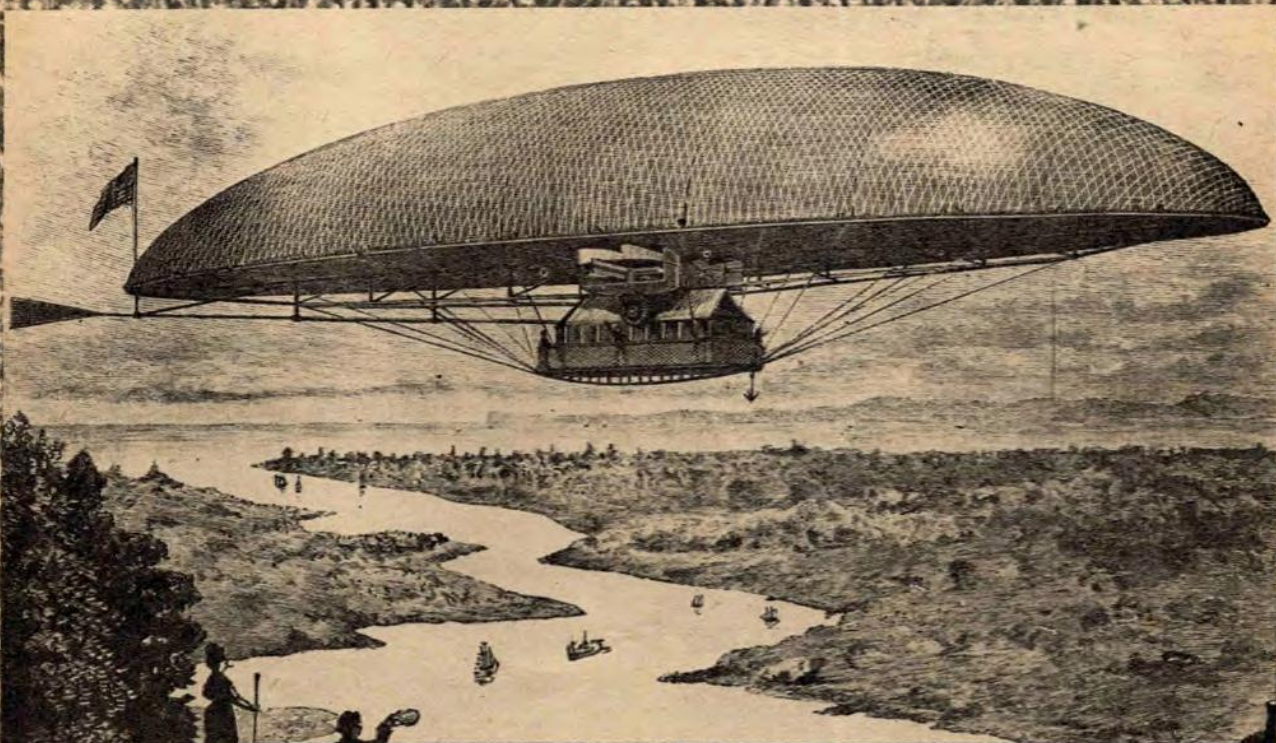


A real riddle is Aerial Ship patented by William N. Riddle of Crowley, Texas. Was to carry goods and passengers—an early attempt at canning, no doubt. Wind mills were to be connected to "suitable" motor.

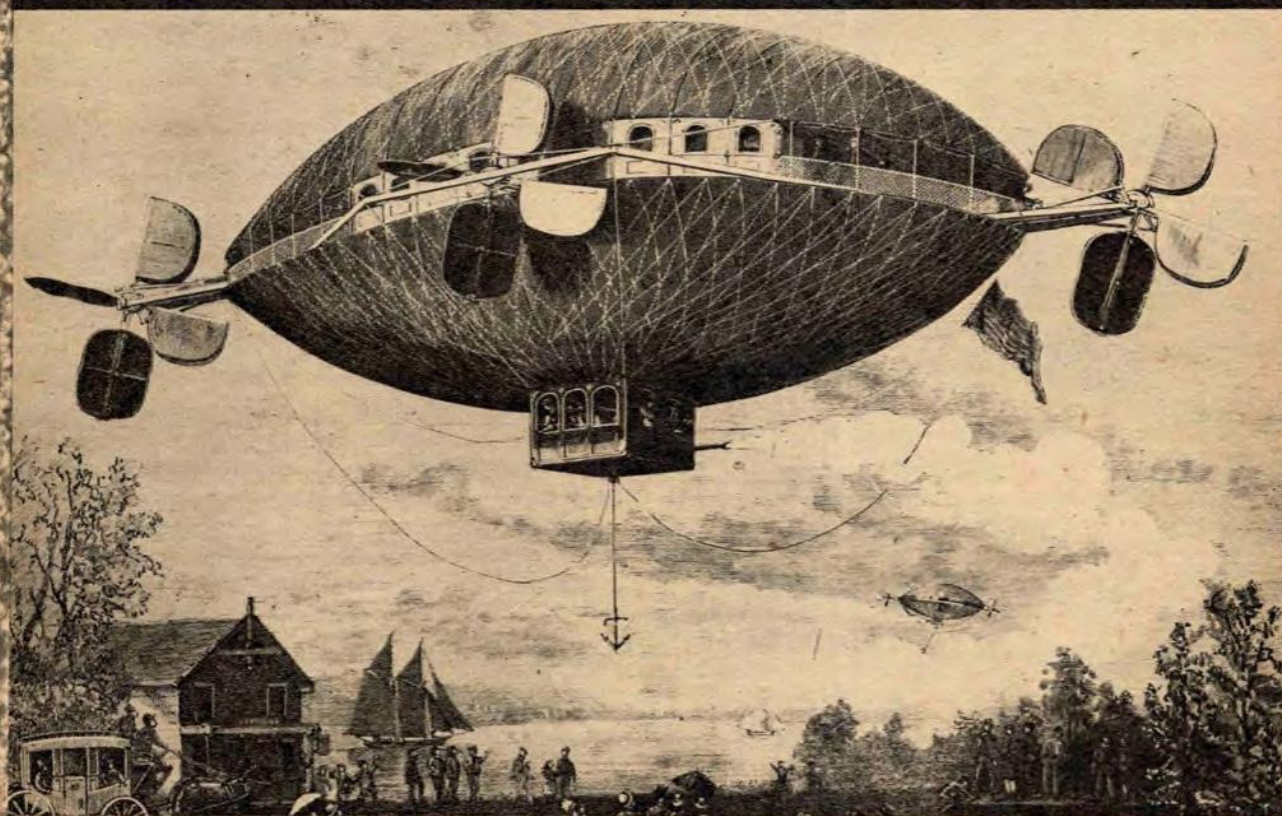


Muscle-powered flying machine by T. A. Stark of Ottawa, Ill. Had several advantages. Besides providing a pleasant medium for an aerial outing over the briny deep, was said to be an excellent body-builder.





Flying flat bottomed cigar with attached summer cottage (above) was the invention of Dr. Martin Braun of Cape Vincent, N. Y. The 1887 Graf Zeppelin had elevating and propelling mechanism consisting of two horizontally revolving wheels operating from main shaft located inside of cabin connected to an electric motor of 2 hp. Judging from size of gears, the hp figure was a mite optimistic. Below: Of the same vintage was the Spheroid dirigible by Moses C. Cole of Nicaragua. It consisted of two half spheres holding gas, with the passenger cabin sandwiched in between for warmth (no doubt), as it must have been breezy there due to proximity of propellers. In a less cozy position was crew and engine compartment suspended below bag. Engine shaft to props extended through bag.





By DOUGLAS ROLFE

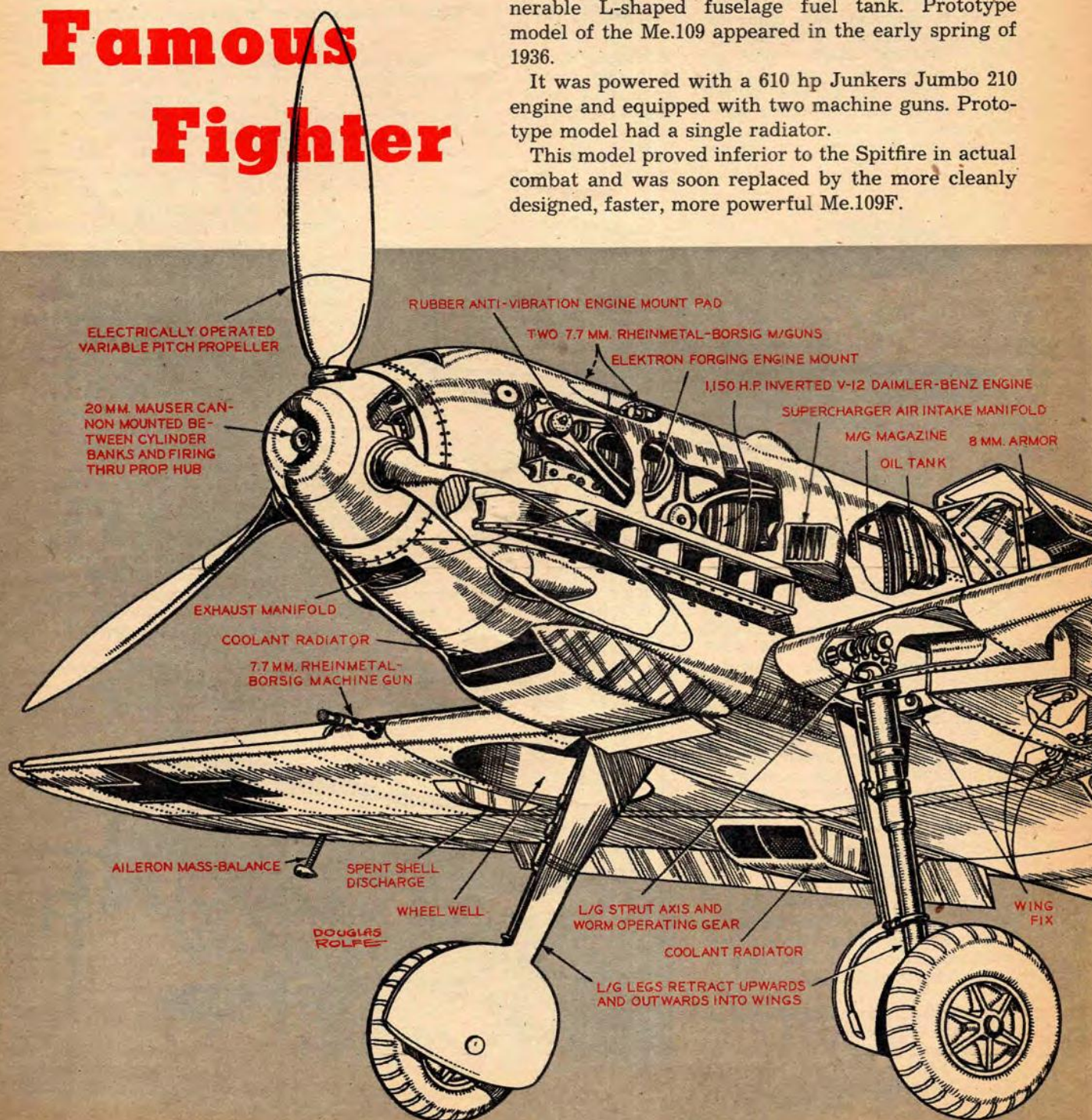
# Germany's Most Famous Fighter

The Battle of Britain Messerschmitt with 1,150 hp Daimler-Benz DB. 601 engine. A modified version of the fighter with which Germany entered the war, the 109E was the top Luftwaffe fighter opposed to the Spitfire and the Hurricane during famous Battle of Britain. Top speed was about 354 mph and armament varied from one cannon and two machine guns to the arrangement shown in this drawing.

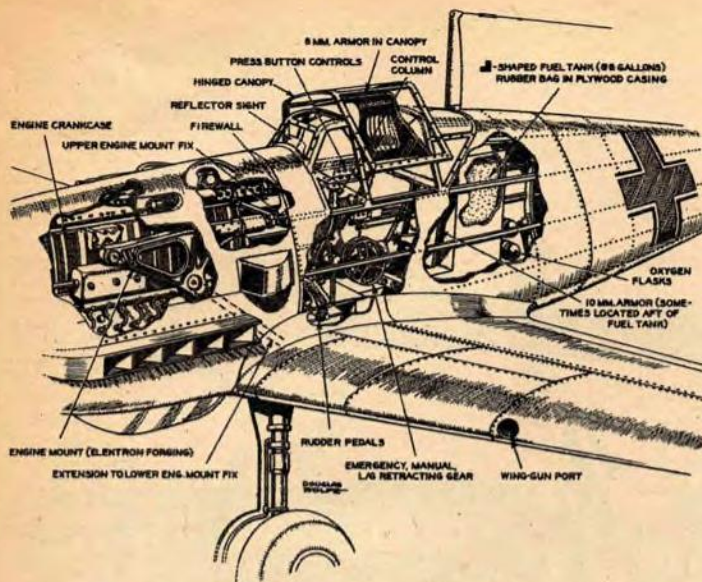
The 109E was first model to introduce defensive armor, previously lacking. Disposition of armor varied—some models having armor behind the vulnerable L-shaped fuselage fuel tank. Prototype model of the Me.109 appeared in the early spring of 1936.

It was powered with a 610 hp Junkers Jumbo 210 engine and equipped with two machine guns. Prototype model had a single radiator.

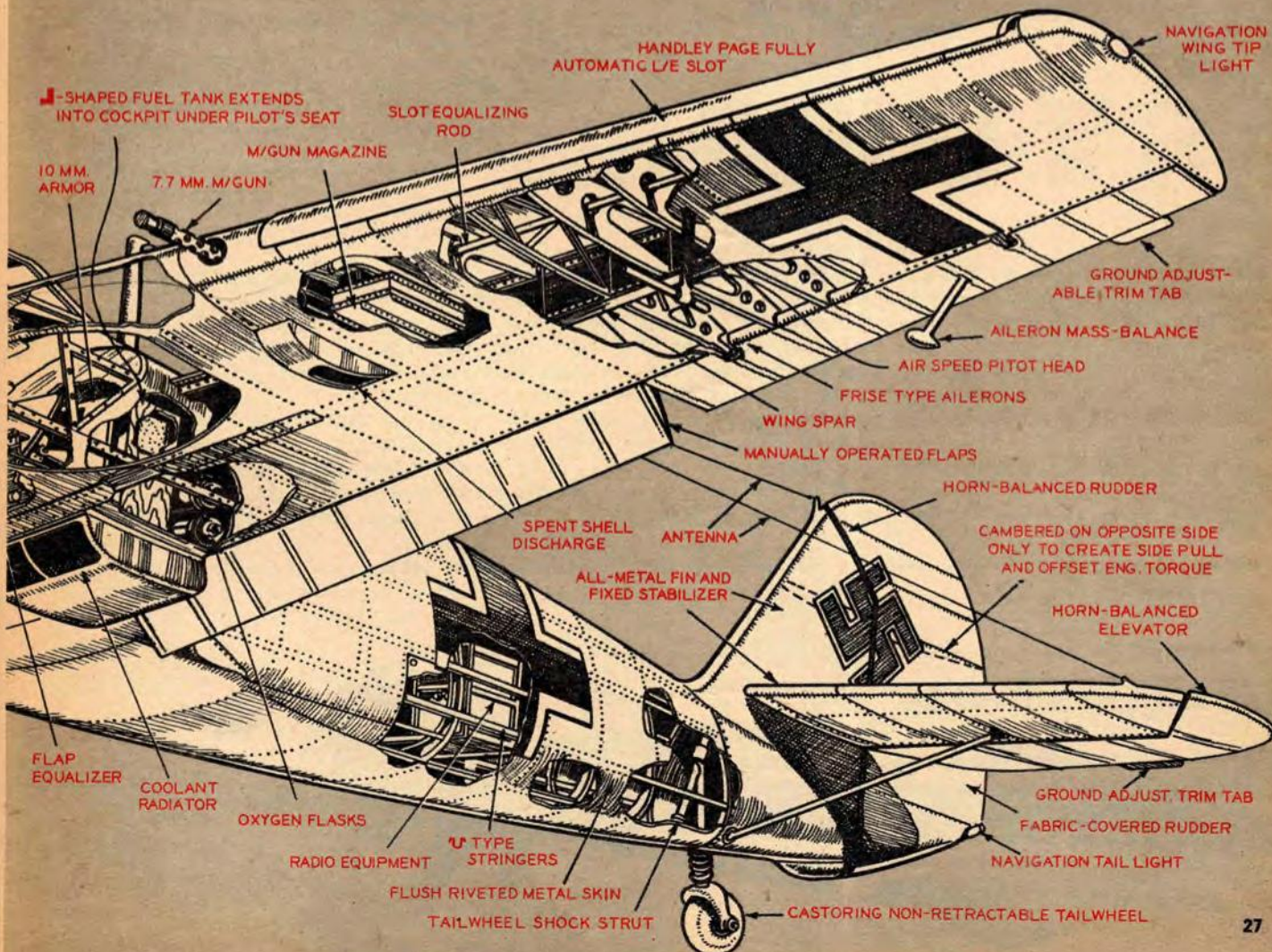
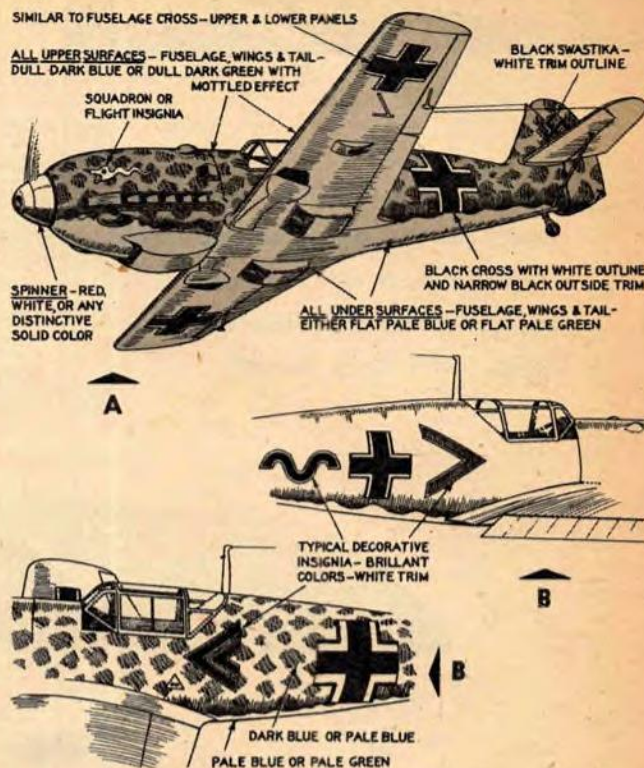
This model proved inferior to the Spitfire in actual combat and was soon replaced by the more cleanly designed, faster, more powerful Me.109F.







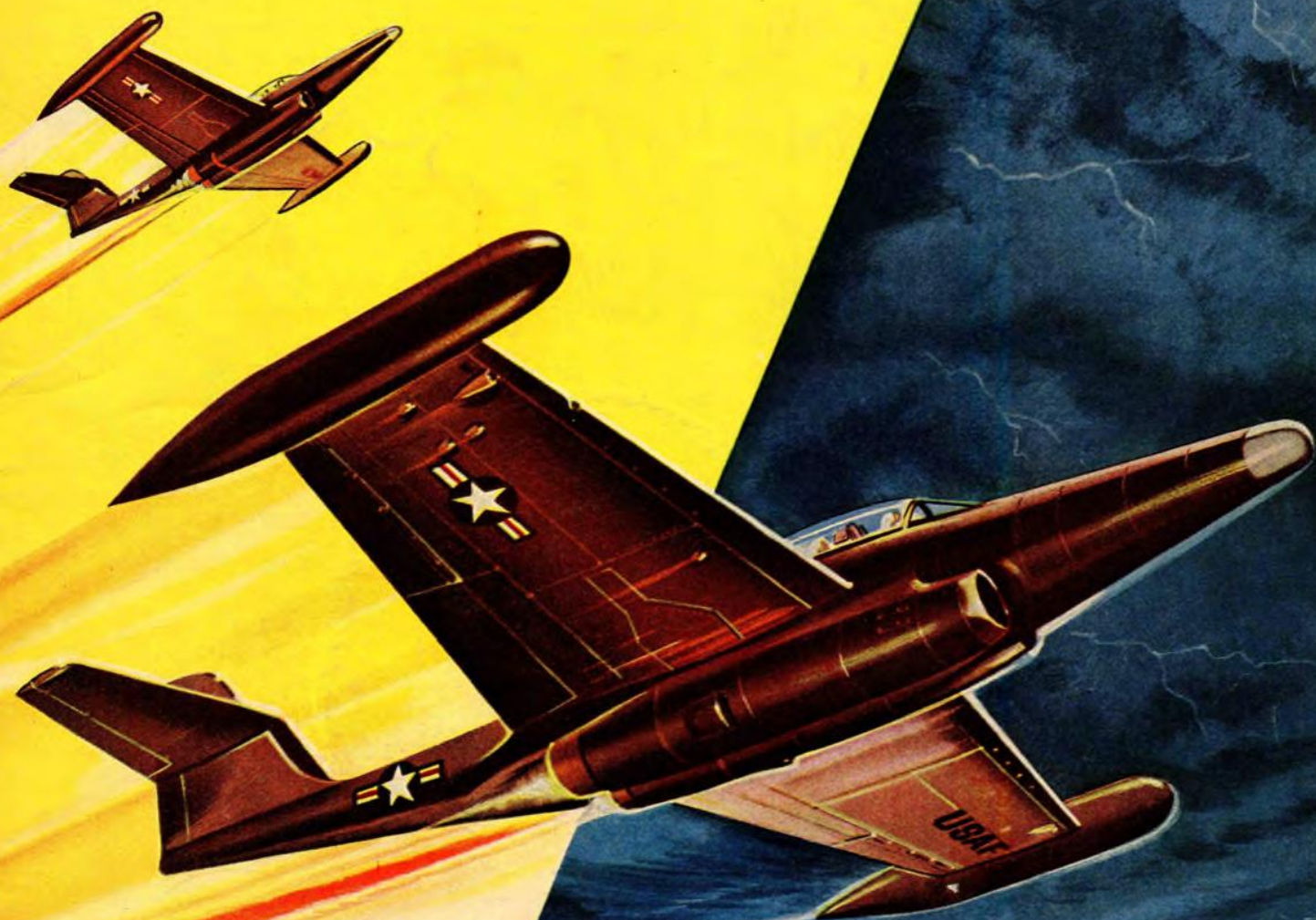
Cockpit details, Me.109E. Source for cutaway and this cockpit drawing was captured Me.109. (A) Basic color scheme of Me.109 in 1940. Illustrated (B) are variations in Luftwaffe cross insignia and typical flight and squadron emblems. Cross with narrow white band and thin black edging (center) gave way to cross with wide white band and heavy black edging (lower) early in the course of the hostilities.





# Air Trails®

MAY 1952  
35 CENTS



Winning Scalars: Page Racer and Dart Kitten  
Reinhardt's "Gallopig Comedian" Stunter

*zboyan-*



# AIR TRAILS

May  
1952  
Vol. 38, No. 2



Cover: Northrop All-weather F-89 Fighter—Zboyon

## THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

**Editor:** Albert L. Lewis. **Technical Editor:** Alexis Dawydoff. **Editorial Production:** Carl Happel. **Art Director:** W. F. Tyler. **Editorial Assistants:** Rose Borello and Rosalba Accardi. **Special Correspondents—Washington:** Kendall K. Hoyt; **West Coast Modeling:** Dick Everett.

### STREET & SMITH PUBLICATIONS, INC.

President.....Gerald H. Smith  
Executive Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 1052 W. 6th St., Los Angeles 17, California.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright, 1952, by Street & Smith Publications, Inc. 35c per copy—\$3.50 per year, \$7.00 per year in countries of the Pan-American Union; \$4.50 per year in Canada; \$10.00 per year elsewhere. This issue is Vol. XXXVIII, No. 2. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FOR THE READER

- 8 Air Notes
- 10 R/C Roundup—Howard G. McEntee
- 12 The Civil Air Patrol Cadet
- 14 Airmen of Vision
- 16 Air Adventurers Club
- 19 Flight Beyond Gravity—Richard C. Early
- 22 Air Progress: Mustang Fighter—D. Rolfe
- 24 Development Highlights
- 26 Three Views and Odd Views
- 28 Half-A Free Flight Scale: Curtiss Racer—Walter A. Musciano
- 32 All-American Pan-Am Plane
- 34 Radio Control Equipment—Howard McEntee
- 36 The Miraculous Models
- 38 Dart Kitten—Paul Palanek
- 44 Galloping Comedian—Harold Reinhardt
- 48 "British Built"—Ron Warring
- 49 Monogram's-Superkit F-51
- 49 Enterprise's MiG
- 50 Supermarine F. Mk. 1 Attacker in 3-View—Bjorn Karlstrom
- 53 How to Make a Drafting Table—Tom Wardlaw
- 54 Dope Can—"Dopester"
- 56 Douglas F3D-1 Skyknight
- 60 Western Roundup—Dick Everett
- 61 American Aircraft Manufacturers
- 66 Mystery of the Missing Beep Box
- 68 Modern Model "Maxwell"—Aubrey Kochman
- 70 Foreign News Notes—H. A. Thomas
- 71 Contest Calendar
- 74 Good Ideas!
- 76 Showcase

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**The R/C Circuit . . .** The Chicago gang ("Chicagoland Radio Control Modelers") would like to say thanks to you for the fine articles on radio control that have been appearing in Air Trails.

We had just about given up when much to our surprise Howard McEntee came through with just what the R/C gang likes to see. Based on the past issues we now know whom to send our news to and have just appointed some of our members to gather news of interest around Chicago.

Clay Freese, President, CRCM

**Mystery Stunter Confesses! . . .** I happened to read an article in the March issue from the Reader section about the "Internats Mystery Stunter."

The individual that was so overrated happens to be me. I would be very willing to correspond with Philip Paul, who inquired.

I'm from Venice, California. However, right now I'm going through pre-flight down in Pensacola. My address:

Nav. Cad. Duane L. Varner USNR, Class 6-52 Batt. #5, U. S. Naval School, Pre-Flight, N.A.S., Pensacola, Fla.

**Tip on Piston Ring Work . . .** While reading Mr. Walton Hughes' "Adding R.P.M.'s to Piston Ring Engines" in Air Trails, I found that he forgot to mention one thing that is very important while working piston rings, and this is after removing the piston a mark should be made on the ring, showing the position of the ring gap before the ring is slipped off the piston. This should be done because in an old engine the ring is not perfectly round, due to wear, and if a ring was to be put back on a piston at a different position, any high spot on the ring (or on the cylinder wall) would cause the ring to be off set and a loss in compression would result.

Yves Beaudoin, Ottawa, Can.

**Model Annual Mail . . .** Received my copy of the Air Trails Annual. Was very pleased with your decision to reserve copies by mail. This will make it possible for all fans to make sure of not missing this fine issue.

You should be very proud of the job you have done. This is the kind of thing that keeps Air Trails in the forefront of the model magazine field.

L. G. Rogers, Magog, P.Q., Can.

. . . I just wanted to express my thanks for a fine mag and your wonderful annual for '52.

Dan Stevens, Albany, Ga.

**Seeks Plans for Red Zephyr . . .** I have been trying in vain to locate plans for Scientific's old "Red Zephyr" model. Have tried several clubs and old-time modelers. Also the Scientific Co.

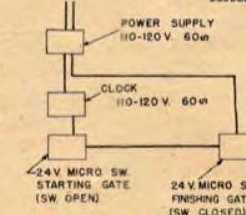
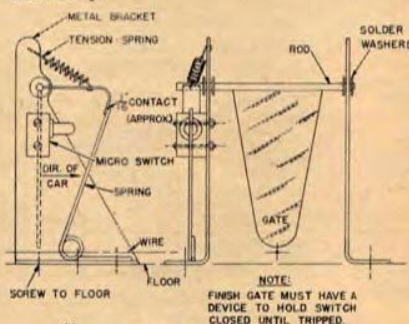
I would appreciate it greatly if you would publish the fact in your Reader's Column in hopes some fellow modeler can inform me as to where I could buy or borrow such plans. Although I didn't have much luck with it in 1937 as my first model (gas), it has the earmarks of a good radio job and would be fun to build again.

Robert Fuller, 111½ So. Eighth St., So. Beloit, Ill.

**CO<sub>2</sub> Cars . . .** We've been reviving competition runs with little CO<sub>2</sub> powered cars. You remember running info on them several years ago? Well, here's our question—do you have any suggestions on timing devices for these whirlwinds?

Lawson Tyler, Chicago, Ill.

● Here's a copy of the electric timing device which Cal-Aero Technical Institute has made available. They state: change clock gear ratio to increase rpm and recalibrate; clock dial should be calibrated to read in decimal seconds; car when passing through start gate closes circuit, starting timer—passing through finish gate the car opens circuit, thus stopping timer; 24 V. standard aircraft micro switches work satisfactorily on 110 V. line—resistance can be added if necessary.



**"AT" for the Record . . .** We are in process of compiling a book of press clippings which will become a permanent part of the Squadron's Historical Records.

The March 1950 issue of Air Trails contained material pertinent to this squadron and a copy of it will make a valuable addition to our scrap book.

Lt. Russell B. Tatum, Adjutant, 85th Bombardment Sqdn., Light, USAF

### NOTICE TO SUBSCRIBERS

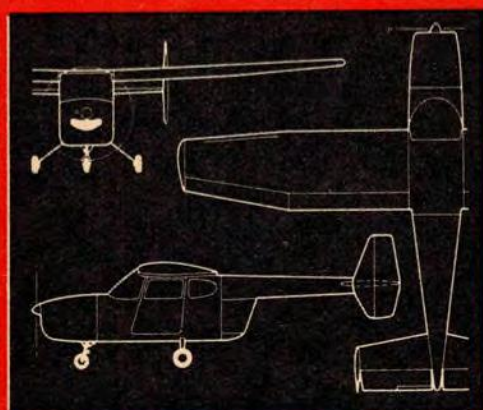
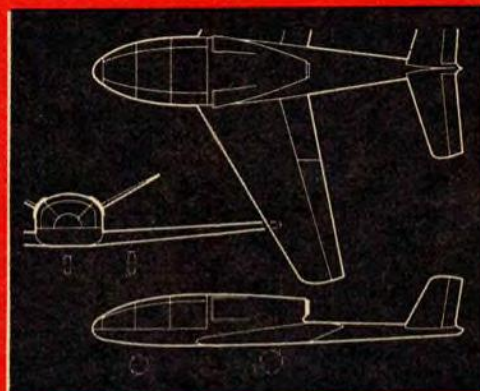
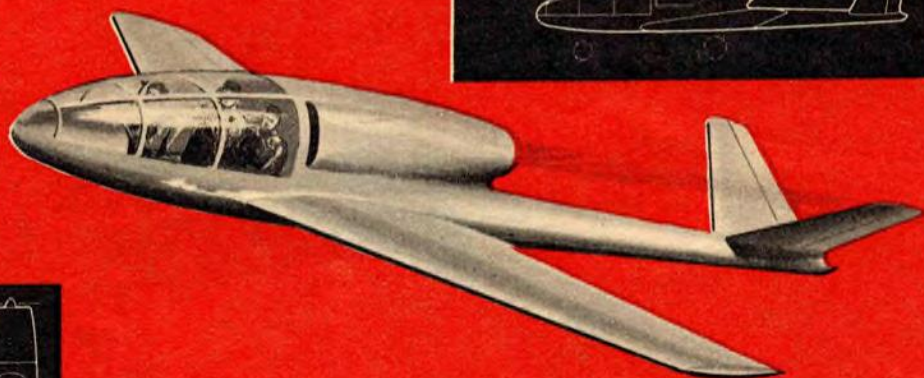
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



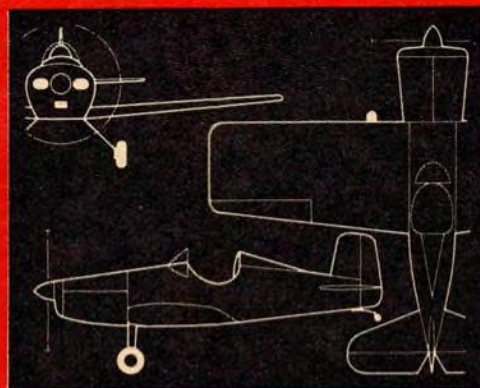
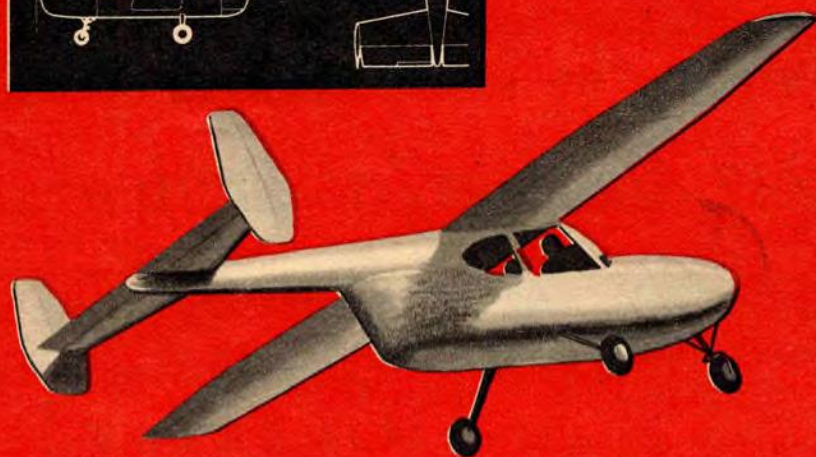
# Airmen of Vision

## DESIGN COMPETITION

This month's honors go to Leonard Wood of Somerset, Mass. age 13, who sends in his design for a jet-powered lightplane. It is a very nice straightforward little craft that ought to be just the ticket for one of these Continental Turbomeca jet plants to be produced soon in this country. With about a 600 lb. thrust engine it should hit 250 mph.



Aage Roed of Detroit, Mich. calls his plane the Flying Station Wagon. It has been designed for general utility, to serve as pleasure craft, light cargo and ambulance. Plane bears marked resemblance to the British Auster B-4. Wingspan is 35 ft., length 24 ft., 10 in. It is powered by a 165 hp engine. Top speed is 135 mph.



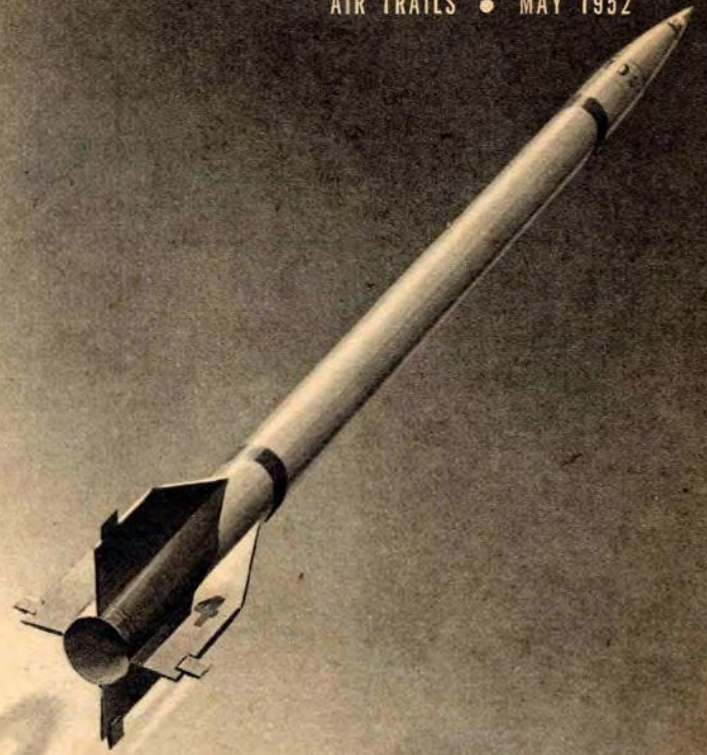
Single-place ultra-light plane by K. A. Stockbarger of Healdsburg, Calif. Designer claims plane could be produced cheaply in package form minus engine as the construction is of wood and fabric. This type of craft is very popular in Europe, offering sportsman pilots an inexpensive way to fly. Stockbarger's ultra-light has a span of 18 ft., weighs 720 lbs., is powered by a 65 hp engine and is capable of a speed of 130 mph.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





## Flight Beyond *Gravity*

**This very year simian astronauts will rocket aloft to help USAF scientists prepare Man for the hazards of travel into cosmic space**

**By RICHARD C. EARLY**

■ A new super-rocket will go screeching into the ionosphere this year with its first supercargo of passengers.

They won't be humans—yet. These first living astronauts will be guinea pigs, chimps, goats, and perhaps other laboratory mammals. Within their supersonic ark, these pioneer space voyagers will be wired-up to record physiological behavior such as pulse rates, respiration, reaction to heat and G forces. What the experts of the U.S. Air Force's Department of Space Medicine learn from this and subsequent experiments will pave the way for



On bottom of tight outside loop centrifugal force adds to the gravitational pull. Pilot falls and is pulled downward against belt.

PLUS GRAVITY

ZERO GRAVITY

On outside loop in carefully calculated orbit ellipse the centrifugal force balances gravitational pull. Pilot floats between belt and seat.

the safe ascent, later on, of human rocketeers.

Taking animals for supersonic rides is just one phase of the unusual research which has been going on for three years at Randolph AFB, San Antonio, Texas, under the guidance of four scientists from Germany. Their activities cover all the conceivable—and some rather inconceivable—hazards of travel outside the earth's atmosphere. Their research also includes the methods Man might use to get himself this far out on the limb and back again.

It is little wonder that the flying cadets and other habitués of Randolph AFB often speak of the scientists as the "Buck Rogers Boys." This is well-meant and implies not a little awe, since local

rumor has it that Drs. Hubertus Strughold, Konrad Buettner, Heinz Haber, and Fritz Haber were key men in some of Germany's most fantastic V-weapon research.

Despite the remarkable amount of data they now have on hand, these scientists—who serve under the direction of Major General Harry G. Armstrong, Surgeon General of the USAF—speak conservatively of their research: "Space medicine is in relatively the same stage as was aviation medicine in the late Twenties."

To draw analogy, you recall that our speediest fighters then did a whopping 200 miles per hour; and when our flyers reached 25,000 ft. they could brag about it as a feat. Men have recently flown six times this fast and three times as high into the stratosphere. Bridgeman, Mays, Yeager, Everest, et al have made such flights safely and even with reasonable comfort, thanks to the progress of aviation medicine. The aero-medical people, however, have always had to catch up with the aero engineers. They lag slightly even today, since we have succeeded in streamlining the planes better than we streamlined the pilots.

Space medicine, on the other hand, must have the answers in advance, if those first astronauts are to return alive and healthy. And aside from the humanitarian aspect, the team of space experts points out that, "In view of the tremendous expenditure required to approach space, it would be foolish to jeopardize the possible success of a flawless machine by human failure. Before the plans for the first space ship can be laid out, the science of space medicine must have solved, as completely

as possible, the human problems involved in space flight."

Dr. Buettner explained at this point, "In the ionosphere a man would be subjected to some strange and unnatural conditions. We know in a general way right now what these conditions will be. What we don't know is how humans will react under this environment. We hope to simulate some of these conditions in the laboratories here and observe human reactions to them. Only this way will we be able to prepare the man and arm him against these space hazards."

Strughold and company were too polite to say so out loud, but the implication was clear that nobody had better attempt to make a hero of himself by stowing away in a V-2 or a Viking until the Department sends up a few of these laboratory trial balloons, plus a few monkeys.

The gravity-free state is their top-priority problem at the moment. The astronaut, they say, will be weightless for long periods of time. One's body, traveling in the same orbit as the ship, remains in the same state of delicate balance that keeps a satellite going without any power. You no longer weigh anything. You float through the air with the greatest of ease. To get from one side of the cabin to the other you would have only to push off from the wall or floor, as you would in a swimming pool.

This may turn out to be an exhilarating experience. It may also be such a terrifying ordeal that you would blow your top after just a few minutes of this "free flight." The space men are not certain, as yet, which it would be. They think you would have a continual sensa-



At their Randolph AFB office, stand (left to right): Dr. Heinz Haber, astronomer; Dr. Fritz Haber, aeronautical engineer; Dr. Hubertus Strughold, physiologist and director of Department of Space Medicine, and Dr. Konrad Buettner, bio-climatologist.



MINUS GRAVITY



On top of tight outside loop the centrifugal force overpowers gravitational pull. Pilot is thrown upward against belt.

tion of falling into a bottomless pit; but even if you enjoyed the experience subtle disturbances within the nervous system might make you sick as a dog later on.

Through simulation, the Department of Space Medicine seeks now to prolong an artificial gravity-free state for sufficient time to study human reactions. Gen. Armstrong, our number-one flight surgeon, designed the first successful low-pressure chamber back in the days when he was a Wright Field captain. By placing first animals, then humans in the chamber, we learned without ever going higher than a two-story building what really happens to a man at high altitudes. This simulation saved the lives of countless pilots and led to the development of today's reliable oxygen masks and pressurized cabins. But the general is the first to admit that simulating zero gravity will be a much neater trick.

To serve their purposes, this state of weightlessness must be achieved in much the same way as it would occur in space flight. The learned doctors have figured out a ballistic trajectory that happens to be the same kind of perfect ellipse which is followed in the orbits of heavenly bodies. They will sort of hitch their wagon to a star, so to speak, by having a specially-equipped T-33 Shooting Star fly around this curve at just the right speed to imitate the ballistic trajectory.

During the time that the T-33 is in this magic curve—which, on paper, looks like the top third of an outside loop—both the subject and the pilot will remain suspended between seat and safety belt in a state of zero gravity—neatly in balance between cen-

trifugal force and the forces of gravity and inertia. The subject will, of course, be wired up with all sorts of instruments and gadgets for recording his responses. This 2½-mile curve is shown in the accompanying diagram.

Dr. Fritz Haber explained that, "Because no pilot would be able to fly such a trajectory accurately, we intend to use a special auto pilot which is activated by a 'three-dimensional accelerograph.' Air friction, and resistance which spoils all theoretically perfect trajectories, will be counteracted by the thrust of the powerplant, and the plane's speed will be a constant 450 miles an hour around the parabola."

The pilot and subject will be weightless for only 35 seconds. They can flatten out the curve over a longer distance and maintain a "sub-gravity" of 0.5G for about a minute. The space men admit that they won't have very long periods for observation, but that by selecting certain problems or phases for investigation at a time they can learn a lot during the short interval.

The reason why the Department of Space Medicine is going to such great lengths to make you weightless the hard way is that so many of one's natural actions and reactions may be changed. The muscle sense which governs so many of your movements from childhood will be short-circuited, since these work either with or against gravity. In space you won't know your own strength: nothing weighs anything, yet your muscular strength remains as great as ever. You'll have to orient yourself optically; and unless you have a better sense of balance (Continued on page 73)

AURORA BOREALIS

METEORS

110 MILES

459.5°



50 MILES

122°

COSMIC

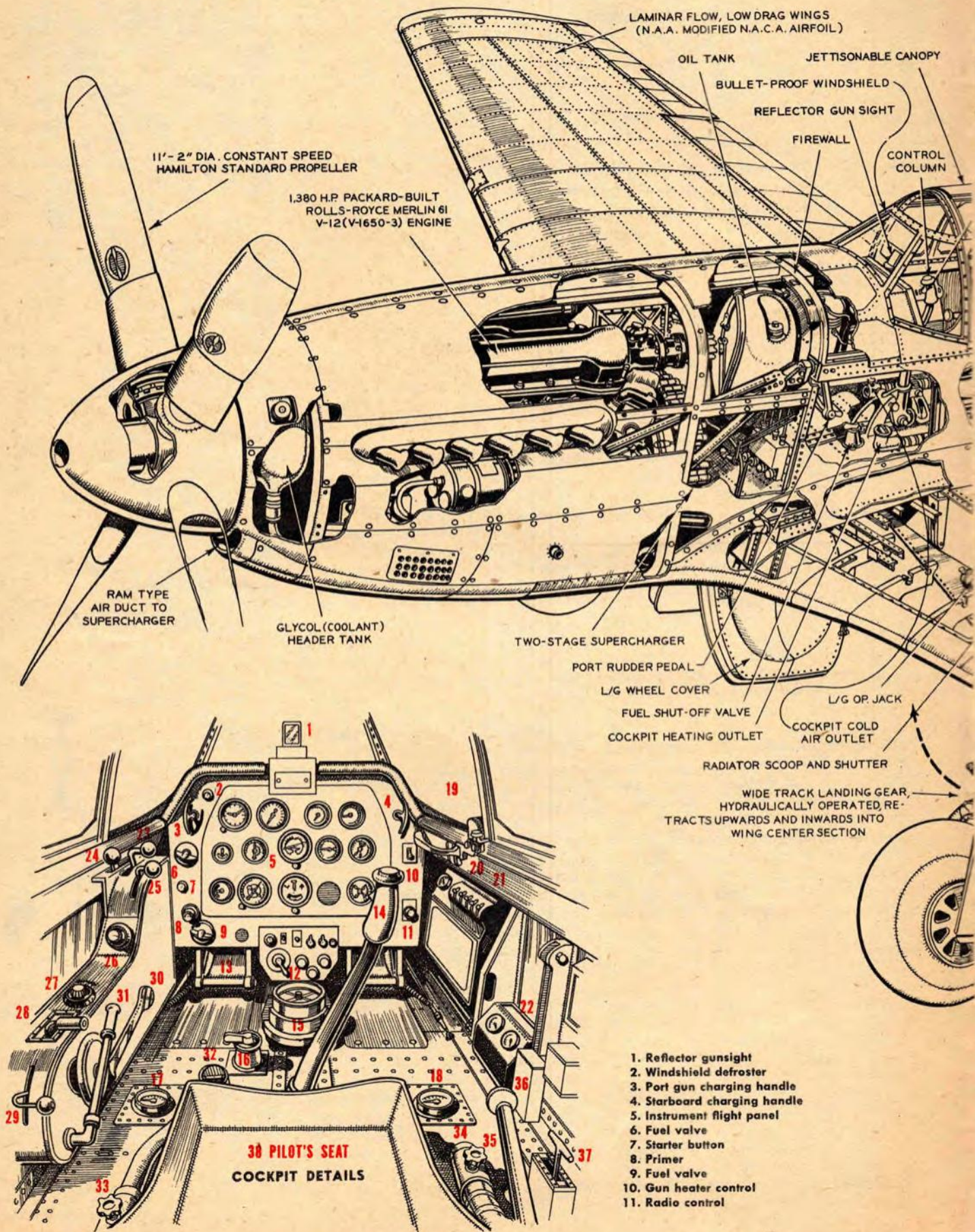
RAY

8 MILES

67°



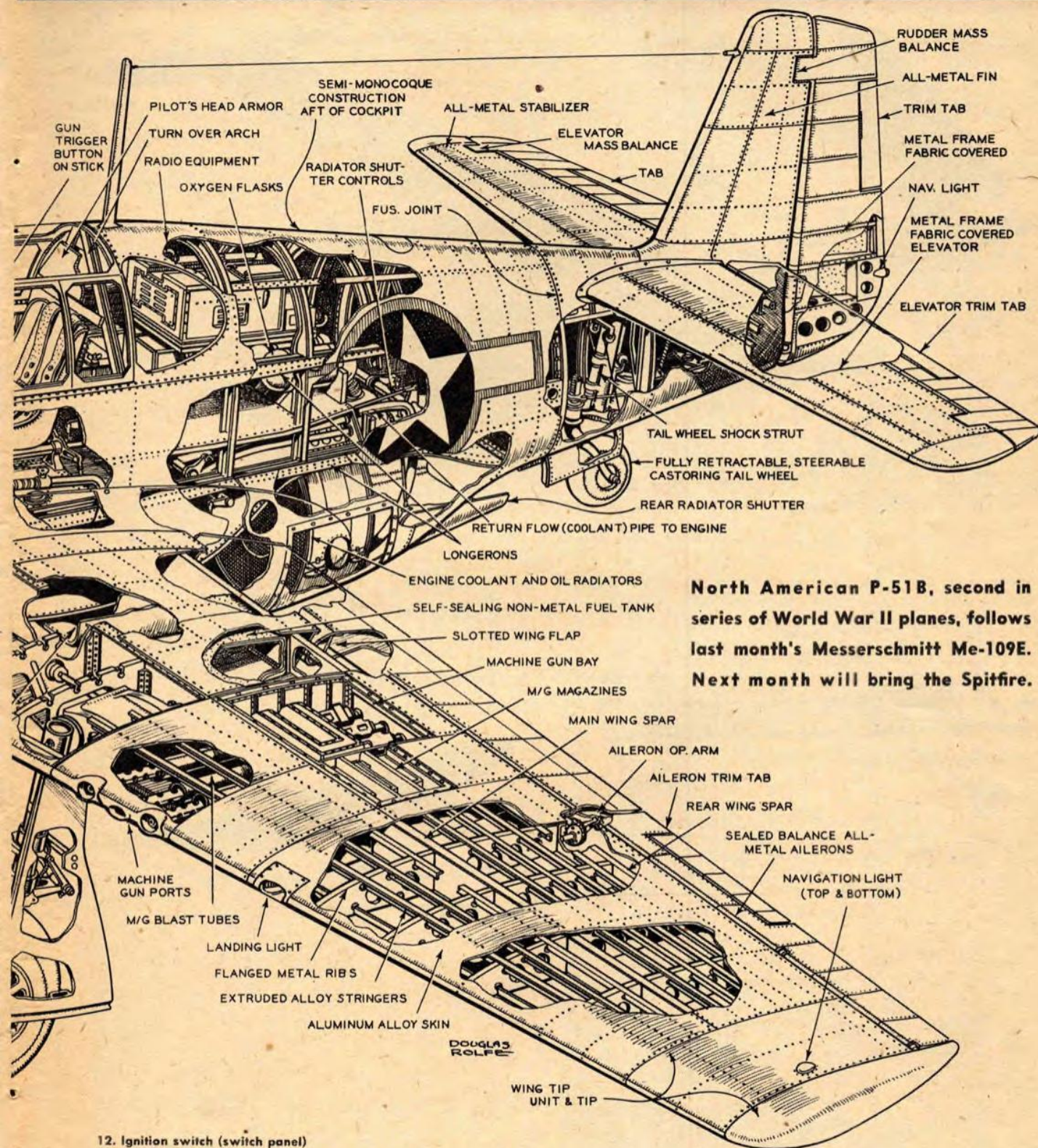
# AIR PROGRESS:





# MUSTANG FIGHTER

By DOUGLAS ROLFE



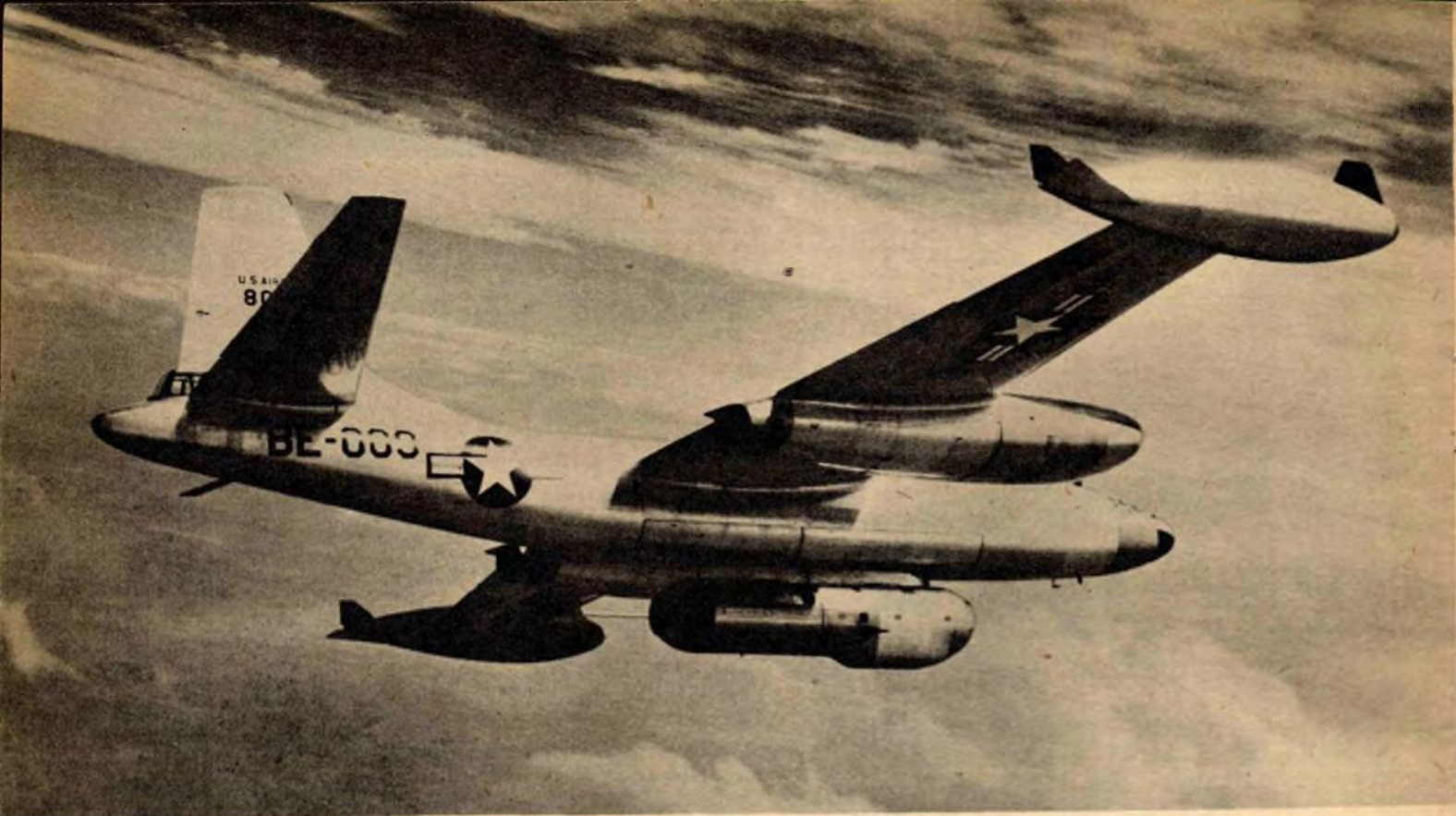
North American P-51B, second in series of World War II planes, follows last month's Messerschmitt Me-109E. Next month will bring the Spitfire.

12. Ignition switch (switch panel)
13. Rudder pedals and brakes
14. Control column
15. Magnetic compass
16. Fuel shut-off
17. Port fuel tank gauge
18. Starboard tank gauge
19. Canopy emergency release
20. Generator ammeter
21. Switches
22. Oxygen system regulator

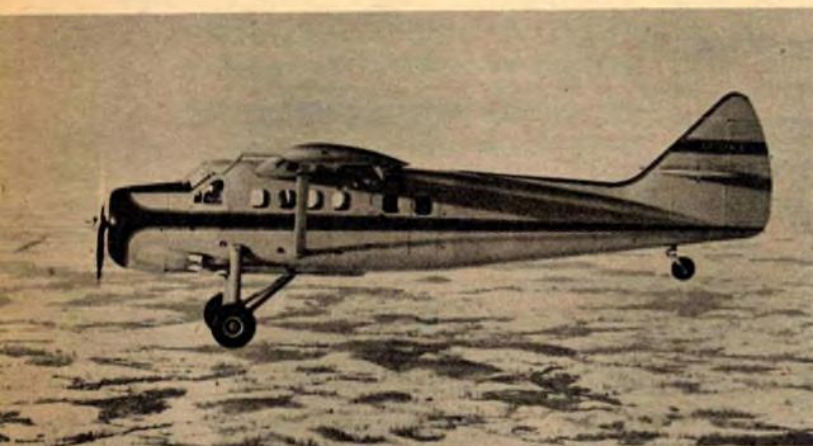
23. Mixture
24. Throttle
25. Propeller pitch manual control
26. Aileron tab control
27. Rudder tab control
28. Radiator scoops control
29. Flap control
30. Landing gear selector lever

31. Tail wheel lock
32. Cold air duct
33. Cold air control
34. Warm air duct
35. Warm air control
36. Hydraulic hand pump
37. Automatic recognition device control
38. Pilot's seat





North American B-45 Tornado used by General Electric Co. for in-flight testing of turbo-jet engines. Test plant is carried under bomb bay.



Otter built by de Havilland of Canada has 600 hp engines, seats 8.

Commonwealth CA-22 basic trainer built in Australia. Engine 450 hp.



## Development Highlights



SAAB 210 Draken is Sweden's first Delta wing research plane.

Another Aussie plane, Commonwealth Woomera, recco-bomber.







The Grumman Cougar. Designated F9F-6, this latest Navy fighter is swept-wing successor to Panther. Rated in "over 600 mph" class.



Boeing XB-52 Stratofortress, Air Force heavy eight-jet bomber bears a striking resemblance to the B-47. No information on plane available.

North American XA2J-1 Savage, experimental turbo-prop-powered-carrier-based attack bomber. Has two Allison T-40s of 5500 hp each.





# THREE VIEWS and ODD VIEWS

Bjorn Karlstrom and Shozo Abe pool talents to bring this plane parade

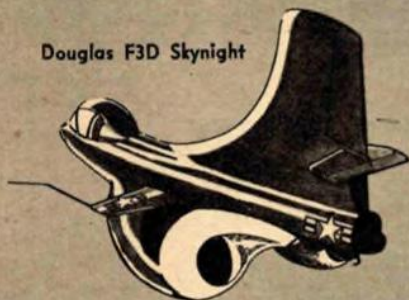


Vought F4U-5N Corsair

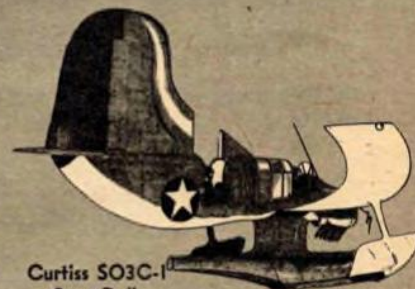


Russia. MiL helicopter

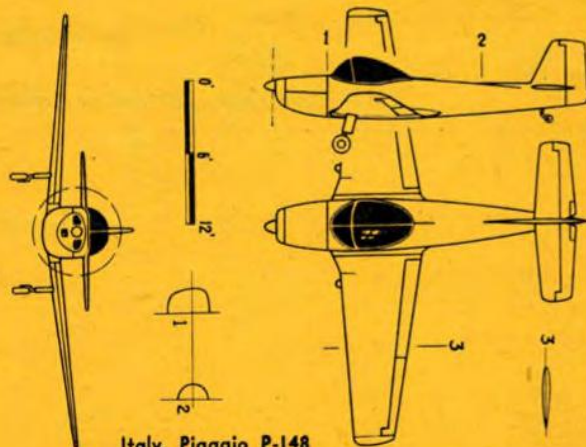
Douglas F3D Skynight



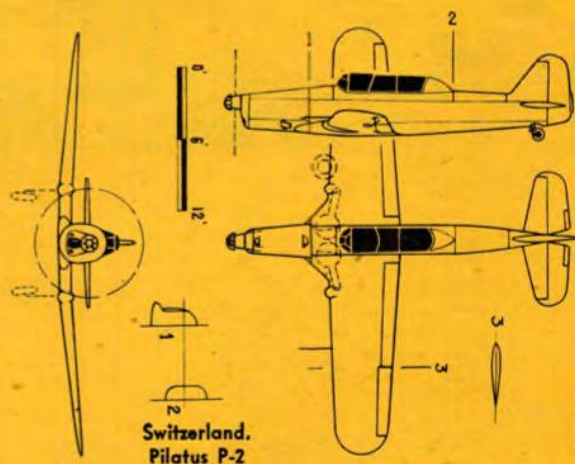
Douglas AD-1 Skyraider



Curtiss SO3C-1  
Sea Gull



Italy. Piaggio P-148



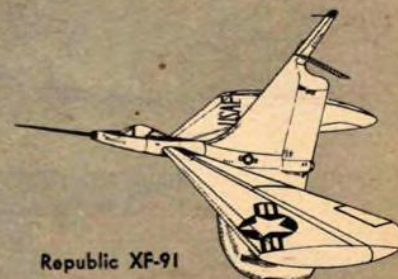
Switzerland.  
Pilatus P-2



de Havilland Vampire



Douglas C-124 Globemaster



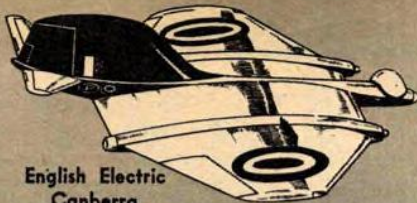
Republic XF-91



Lockheed F-80  
Shooting Star



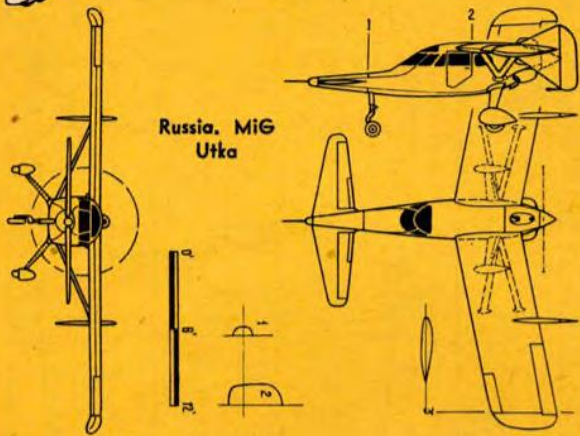
English Electric  
Canberra



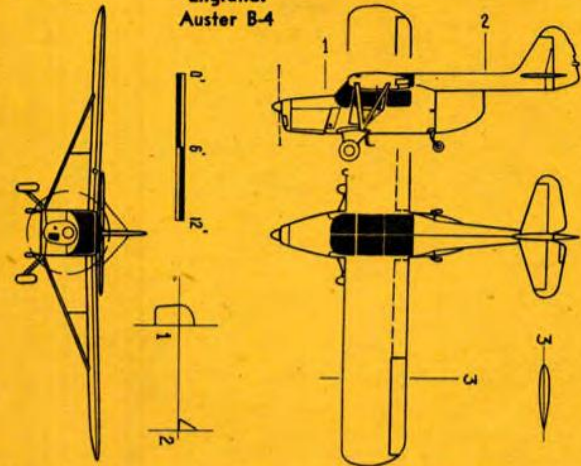
de Havilland Sea Hornet



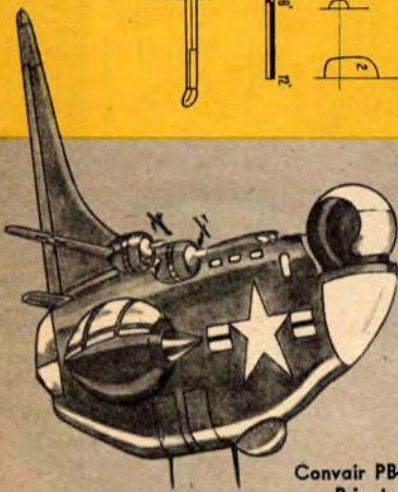
Russia. MiG  
Utka



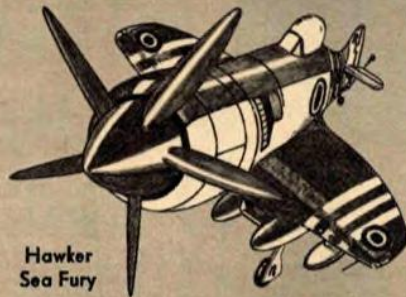
England.  
Auster B-4



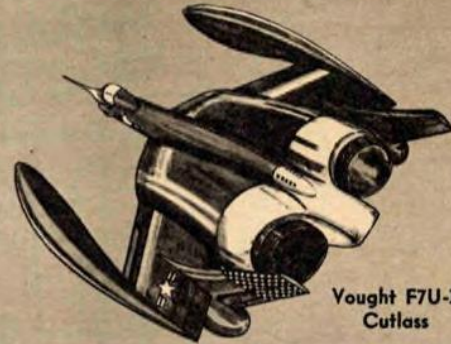
Convair PB4Y-2  
Privateer



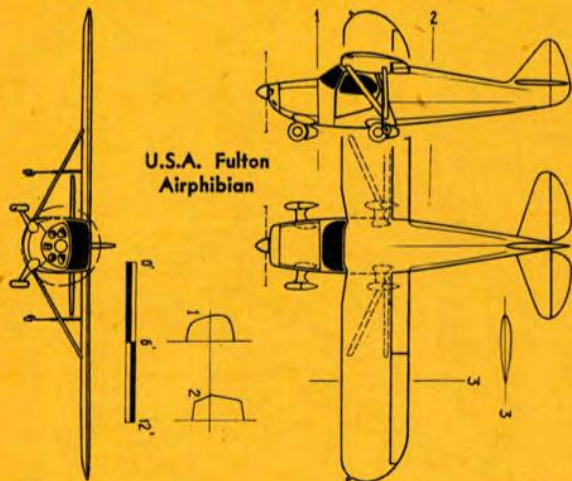
Hawker  
Sea Fury



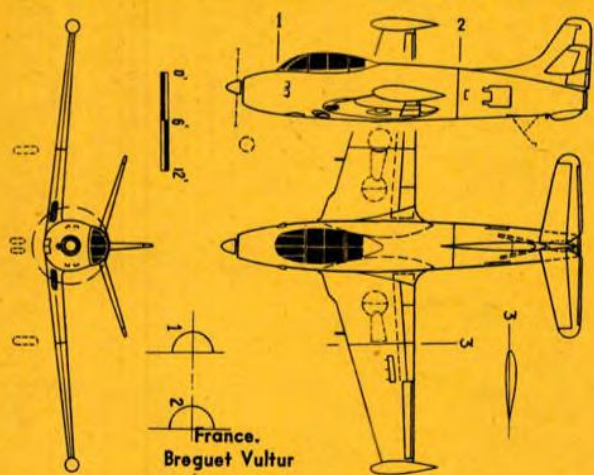
Vought F7U-3  
Cutlass



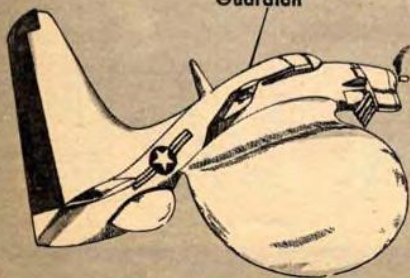
U.S.A. Fulton  
Airphibian



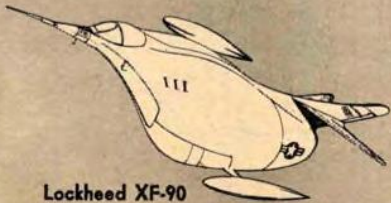
France.  
Breguet Vultur



Grumman AF-2W  
Guardian



Lockheed XF-90



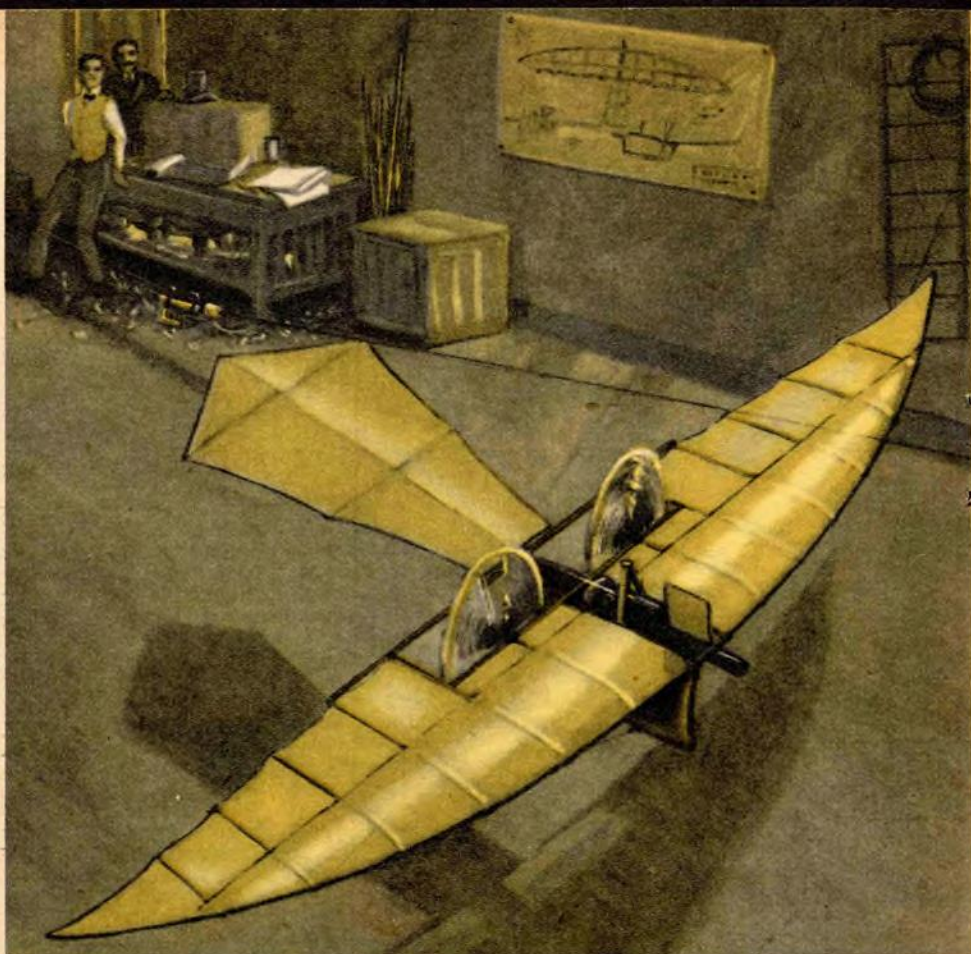
Westland Wivern





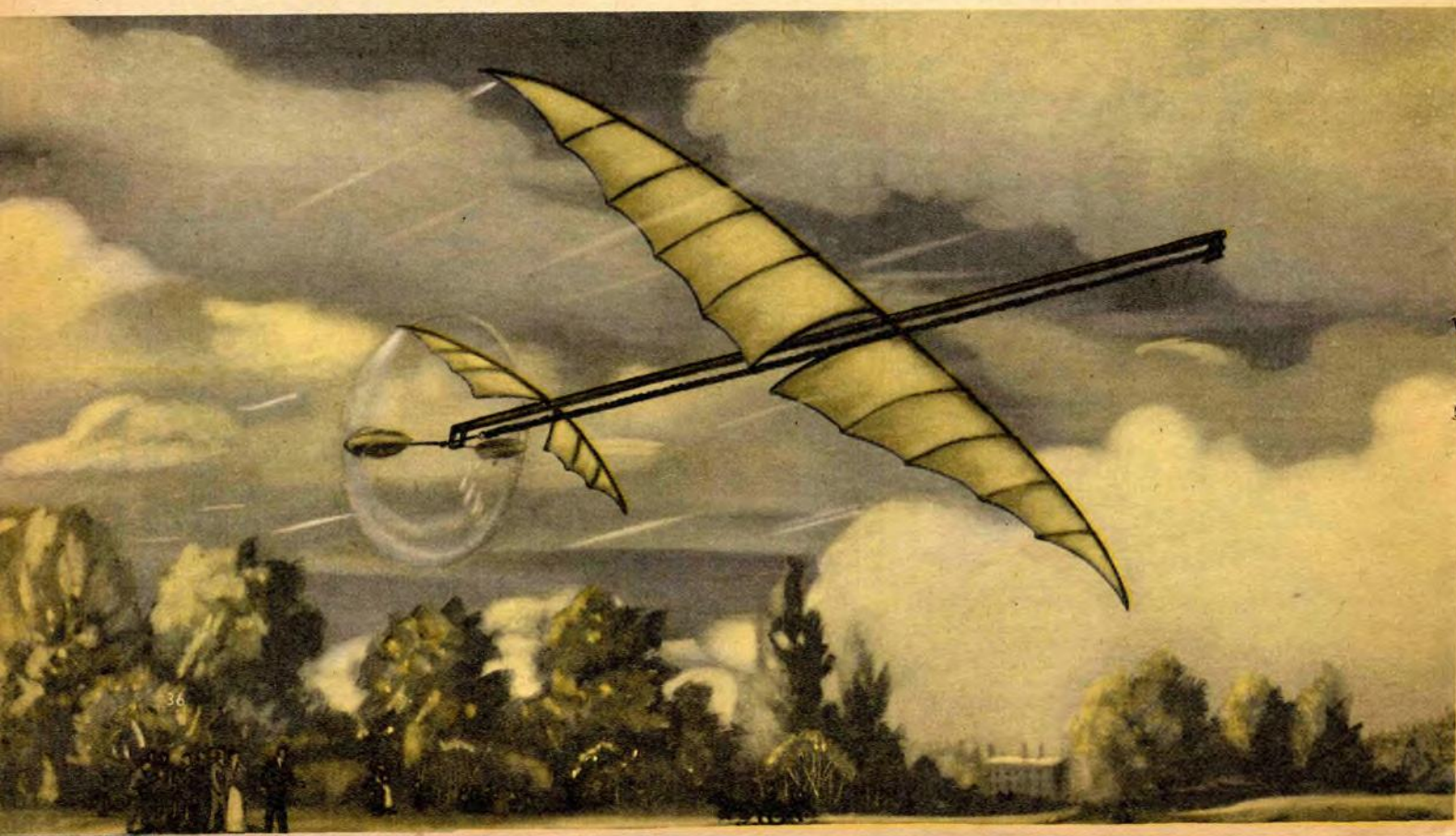
# The Miraculous Models

**There's no chicken-egg versus egg-chicken controversy about aviation—models preceded man-carrying aircraft. Drawings by Charles Hubbell from the Thompson Products aeronautical collection**

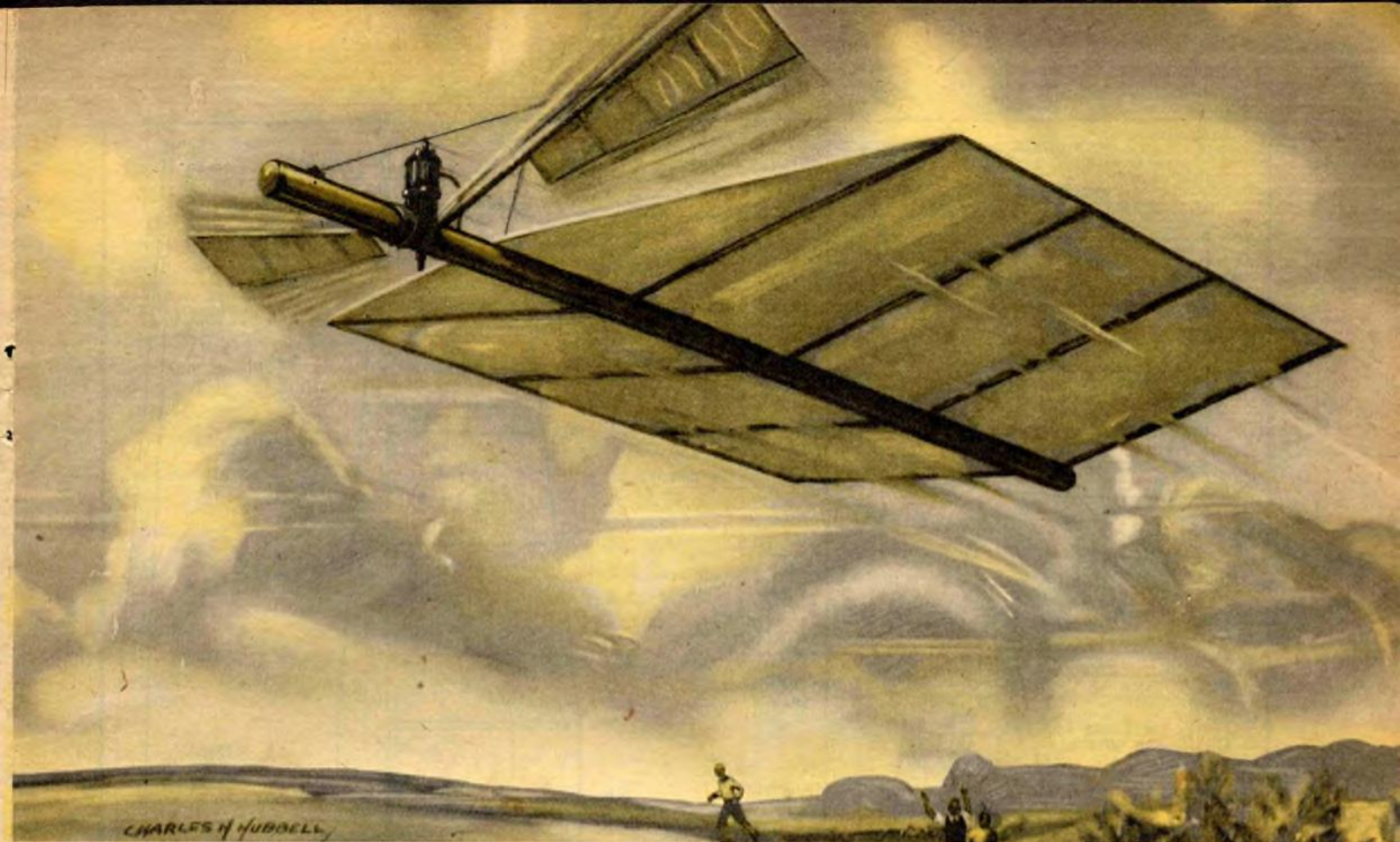


Stringfellow's Steam Model . . . 1848. John Stringfellow began his active aeronautical career at Chard, England, in 1842, as an associate of Henson. He designed and built this steam-powered monoplane of approx. 10 ft. wingspan, 9 lbs. wt. Launched in factory room, its 40-yd. flights were first recorded successful ones by mechanical power.

Penaud's Rubber Powered Model . . . 1871. The son of a French admiral, Alphonse Penaud acquired an excellent engineering education, then turned his talents toward the solution of the problem of flight. He invented the rubber-band motor as power for model aircraft. Patents granted him in 1876 cover an astounding number of features popular in modern aircraft. In 1871 Penaud built his first flying model, which he called the "Planaphore." With it, he achieved creditable flights of nearly 200 feet.

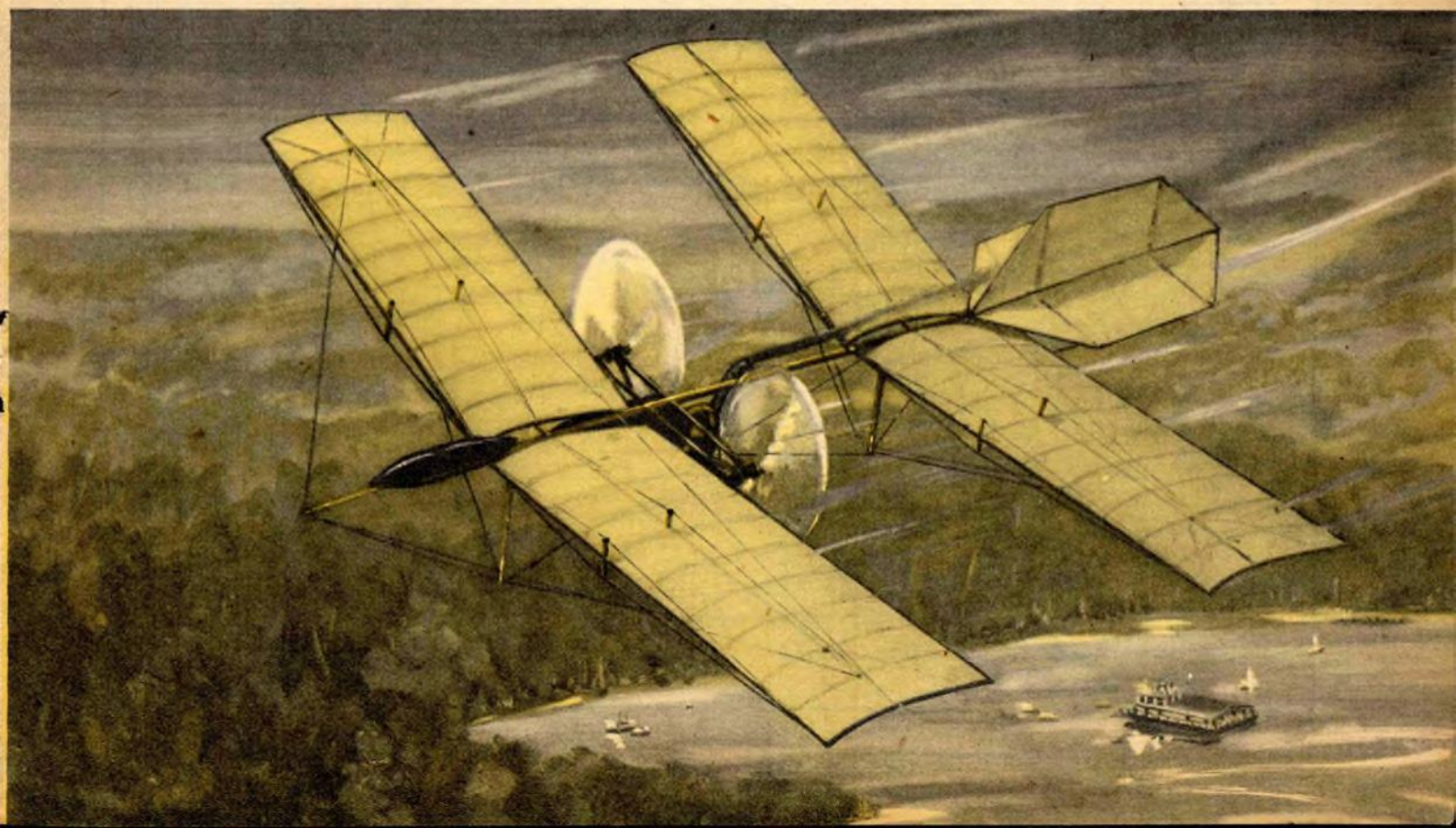






Hargrave, Australian Genius . . . 1892. Lawrence Hargrave of Sydney, Australia, began experiments with models in 1884. His investigations extended to almost every phase of mechanical flight and included the study of flapping wings as a means of propulsion. Among his 50 models was this which flew successfully, using a flapping wing propeller, actuated by a small compressed air motor. His development of the boxkite as a successful man-carrying vehicle had a great influence on the design of early aircraft.

Langley's Successful "Aerodrome" . . . 1896. Prof. Samuel P. Langley had a distinguished career and won many honors for scientific achievement. In 1891 he published his first report on the aeronautical experiments he had conducted. In 1896 two models were tried and one of them proved very successful. It made several flights over the Potomac River near Quantico, Va. The greatest distance covered was about 4,200 feet at a speed of about 30 mph. A man-carrying replica was wrecked during the launching.





JUNE 1952 35 CENTS

# Air Trails

Aviation  
and  
**MODEL  
PLANES**



Fly Bouncing Bertie, Tri-winged Terror • Record Rubber Models  
Scale A/2 Fokker E.1 "Eindecker" • plus Helicopters on Parade



# AIR TRAILS

June  
1952  
Vol. 38, No. 3



Cover: Grumman Cougar  
P-6F-6—by S. C. Smith

## THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Editor: Albert L. Lewis. Technical Editor: Alexis Dawydoff. Editorial  
Production: Carl Hoppel. Art Director: W. F. Tyler. Editorial Assistants:  
Rose Borello and Rosalba Accardi. Special Correspondents—Washington:  
Kendall K. Hoyt; West Coast Modeling: Dick Everett.

### STREET & SMITH PUBLICATIONS, INC.

President.....Gerald H. Smith  
Executive Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison  
Ave., New York 22; Frank C. Smith, Mid-Western  
Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West  
Coast Advertising Representative, Kimball, Menne  
Co., 2550 Beverly Blvd., Los Angeles 4, Calif.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright, 1952, by Street & Smith Publications, Inc. 35¢ per copy—\$3.50 per year, \$7.00 per year in countries of the Pan-American Union; \$4.50 per year in Canada; \$10.00 per year elsewhere. This issue is Vol. XXXVIII, No. 3. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FOR THE READER

- 10 R/C Roundup—Howard G. McEntee
- 12 Air Notes
- 14 Airmen of Vision
- 16 Air Adventurers Club
- 19 Farewell to the Fixed Wing . . . ?
- 22 Development Highlights
- 24 Air Progress: Supermarine Spitfire  
—Douglas Rolfe
- 26 "Inside Story" of MiG-19—James Peck
- 28 Bouncing Bertie—Paul Palanek
- 32 Kit Tips for the Novice
- 34 They Model for Money
- 36 Mini-Paagan—Dennis Davis
- 38 "AT" Forum
- 39 Rubber Powered Champs—George  
DeLaMater and Bob Brawner
- 44 Fokker's First Fighter—W. Musciano
- 48 F&B Aircraft's Colorado Killer
- 48 Contest Craft Co.'s Maryland Mite
- 49 Dyna Model's F-84
- 49 Scientific's P-26A
- 50 We'd Like You to Meet
- 54 Dope Can—"Dopester"
- 56 Douglas A2D
- 58 The Civil Air Patrol Cadet
- 60 Western Roundup—Dick Everett
- 66 Sketchbook
- 69 Contest Calendar
- 70 Mach
- 71 Three Views: Dassault MD-452 Mystere  
and De Havilland DH 110
- 72 Republic F-84F Thunderjet
- 74 How to Wire for Spark Ignition
- 76 Showcase
- 78 For Your Information

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**Model Annual Plans . . .** Congratulations on the production of another terrific Model Annual! This issue really fills the bill on the latest in model aircraft. As a regular subscriber, I recognized some of the models presented in this year's annual. I am very pleased with my copy, and many of my friends have purchased Annuals of their own after glancing at the copy I have.

I noticed that you are offering full-size plans for the airplanes appearing in the Annual. I would like very much to obtain these plans, and I would appreciate a list of those available and the prices of same.

Paul D. Petterson, Minneapolis, Minn.

• Plan ATA #251 contains: Fokker Triplane, 20 inch wingspan, control line for .09 engines; B-36 solid model, 14 inch wingspan; Ole Slippery team racer, 30 inch span, .29 engines; Horton IV flying wing scale towline glider, 35 inch wingspan; Little Senator Half-A free flight, 30 inch span; Bienenstein's Mulvihill Trophy winning outdoor rubber stick model, 54 inch span. Price 35¢.

Plan ATA #522 contains: North American AT-6 control line flying scale with complete cockpit details, 40 inch span for .32 to .60 engines; Bristol Bullet rubber powered scale biplane, 18 inch span; Dunham's All-American rubber powered cabin model, 59 inch wingspan. Price 35¢.

Plan ATA #523 contains: Happy Medium record-holding free flight, .29 or .31 engines, 68 inch span; Executive twin #50 Jetex powered all-balsa semi-scale, 18 inch wingspan; Double Whammy scale-like stagger wing U/C stunt for .29 to .35 engines, 36 inch span. Price 35¢.

. . . In your 1952 Air Trails Annual you had an article called "Build Your Own Receiver-Transmitter." At the end of the article it told where to buy the radio parts, but no addresses. Will you kindly let me know the mailing address of American Telasco Ltd. and Control Research?

Lucien Auletta, Maybrook, N. Y.

• American Telasco, Ltd., 55 West 42nd Street, New York 36, N. Y.; Control Research, Model Division, Box 9, Hampton, Va.

**Correction on Rainbow . . .** In regard to your answer in the April letters' column about whatever happened to the Republic Rainbow: Two Rainbows were built. One crashed at Eglin. The other is being used by Col. Goddard's Photo Test Section at Wright Field to test new Camera Installations. This is the military version and is designated XR-12. Its top speed exceeds 450 miles per hour. It first flew February 4, 1946.

Ken Ellington, Assistant to the President,  
Republic Aviation Corp.

**Likes American Cuties Best . . .** Please send me plan #152 that includes K.C. Cutie. I am in the U.S. Army stationed here in France and although away from home, modeling still absorbs large portion of my time. One attraction of Cutie is that it was designed by a fellow close to St. Louis, and I'm a St. Louisan.

Pfc. Ralph E. Boefer, U.S. Army

**That DC-3 Hum . . .** The picture of a Douglas DC-3 Transport in your "Air Progress" section brought back to my mind a question that I have often wondered about. After talking to several mechanics on the subject, I understand that the DC-3 is powered by either Pratt & Whitney or Wright Cyclone Engines. All of us have seen this airplane fly, and have heard that characteristic "hum" of the engines that denotes a DC-3 and no other plane. It seems logical to me that only one make of engine is capable of producing that familiar sound, and I cannot understand how two different makes of engines sound identical to each other, can you?

Mike Baca, Armijo, New Mexico

• Most DC-3s in operation by airlines are powered by two Pratt & Whitney R-1830-92 engines; comparatively few are powered by Wright Cyclones. It is very probable that those which fly over your territory are powered by Pratt & Whitney engines.

**Open Cockpits and Olden Times . . .** Like the never to be forgotten thrill of that first solo flight, it is only once in a lifetime that such a classic is struck off as "The Open Cockpit Era." (Air Trails, April.)

Walter Fitch, Kansas Governor,  
Soaring Society of America

. . . Let's have more articles like "The Open Cockpit Era." Needless to say, I've read every word of it. Those old-time stories really hit the spot, and bring back wonderful memories.

I still own an old OX Waco (one of the first ones built). It hasn't flown in 10 years but it's in good shape, and stored away. Also have a little C-3 Aeronca.

I would like to purchase photos of some of those old-timers built between 1919 and 1935. Do you or your readers have any information as to where I might get some?

Stanley Dudek, Millstone Rd.,  
Somerville, N. J.

. . . I thought your item on "The Open Cockpit Era" was best reading material on early airplanes.

Tuck Taylor, Belle Plaine, Minn.

. . . Congratulations on an extremely interesting magazine for April. Those old-time stories are wonderful. Also, being an avid old-time fan I can only encourage more old time scale.

Pfc. T. E. Wilson, Amarillo A.F.B.,  
Amarillo, Tex.

(Continued on page 8)

### NOTICE TO SUBSCRIBERS

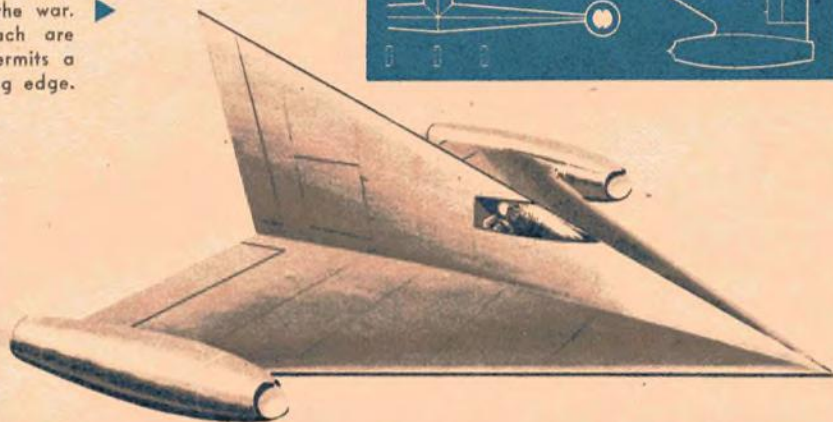
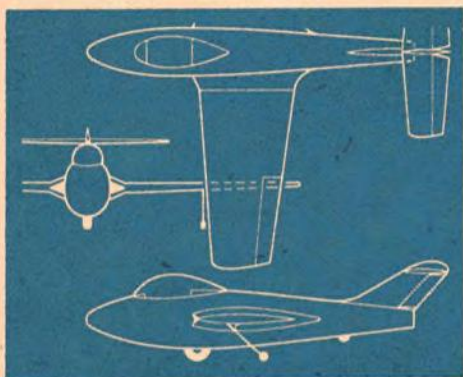
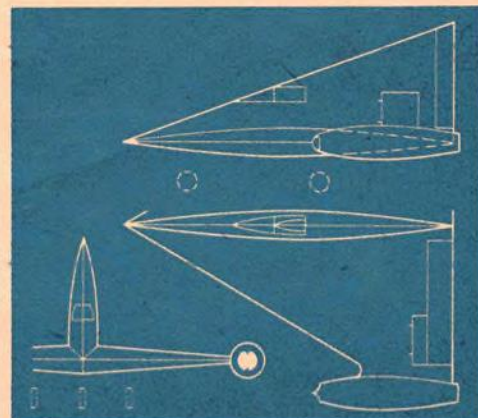
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



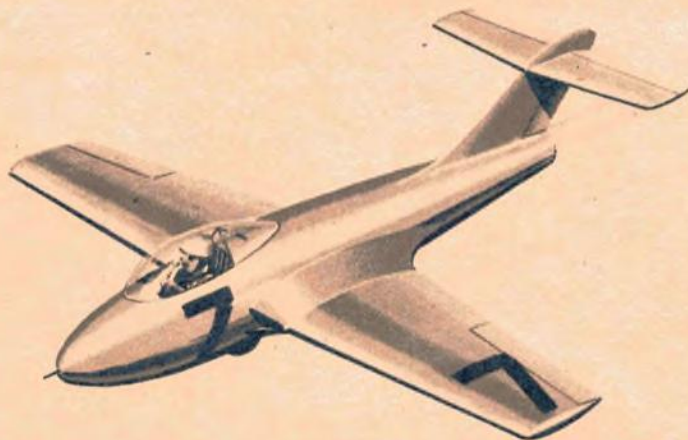
# Airmen of Vision

## DESIGN COMPETITION

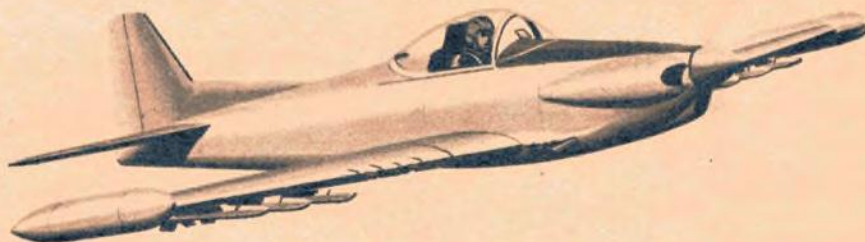
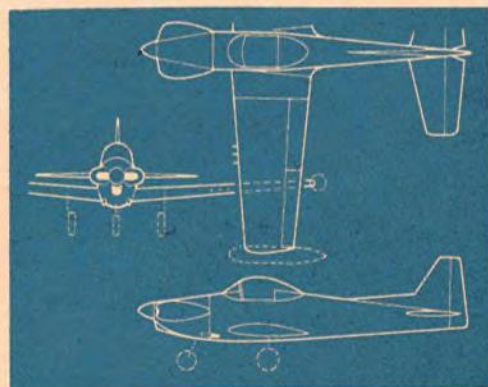
Selected as the best of this month's is the Delta Paper Dart, interceptor by Joe Heim of Detroit, Mich. This design is very similar to the Lippisch Delta under development in Germany towards the end of the war. Two turbojet engines of 6000 lbs. thrust each are mounted on wingtips. Very large wing area permits a generous supply of fuel. Span is 18 ft. at trailing edge. ▶



Here's a very neat Mid-Jet racing plane by Eugene F. Taylor (age 14) of Jersey City, N. J. Main landing gear consists of one wheel mounted in the bottom of fuselage and a small tail wheel. For balance there are outriggers at wingtips. Span of 18 ft., length 14 ft. Engine a 330-lb.-thrust turbojet. Speed over 300 mph. ▶



Designer George Johnson of Louisville, Ky., sent in this anti-tank plane. Armament consists of six cal. .30 machine guns and six 5" hollow charge rockets. Navy version, capable of operating from carrier deck, has folded wings. When heavily loaded with rockets and tip tanks there is provision for jato bottles. Wing-span is 34 ft. and power provided by a 200 hp flat six. Top speed is 200 mph. ▶



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports,) planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





UNITED STATES. Piasecki XH-16, transport helicopter, largest copter in the world. Fuselage is same size as Convairliner, 77 ft. 6 in. 40 passengers or 32 litters. May be equipped with under belly capsule. Two P&W R-2180 engines of 1650 hp each.



FRANCE. Sud-Ouest SO-1120 "Ariel" turbine-powered helicopter. Turbomeca Artouste engine in fuselage drives compressor which delivers air to combustion chambers, on rotor tips, where fuel ignites, giving drive for blades. Rotor 35' 5".



GREAT BRITAIN. Bristol 173. 14-place transport helicopter powered by two Alvis Leonides engines of 570 hp each. Rotors are so coupled that they can be driven by one engine. Rotor diameter 48 ft. 7 in. Will be used for intercity flights.

# Farewell to the Fixed Wing...?

No radical development in aircraft lift principle has made such rapid strides, or gained such universal acceptance as the rotary wing craft. It's caused serious inroads into field dominated by fixed wings



## FAREWELL TO THE FIXED WING . . . ?



**MC-4** tandem rotor two-place helicopter by McCulloch Motors Corp. of Los Angeles, Calif. It is powered by a 200 hp flat six Franklin engine and capable of speed of 115 mph. McCulloch formerly designed and built small 65 hp engine for radio-controlled drones.



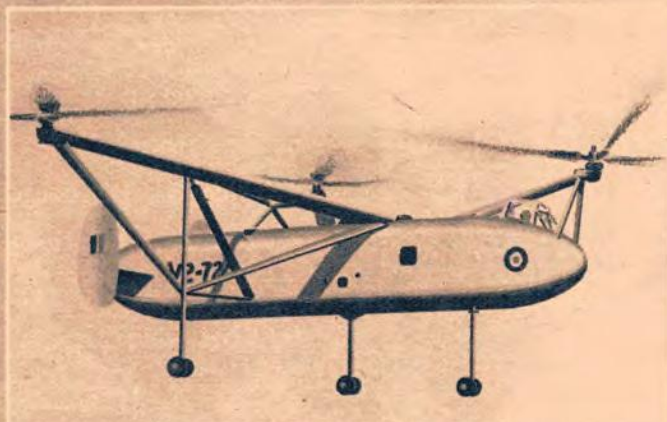
**XJHD-1** large twin-engined, twin-rotor experimental military helicopter built by McDonnell Aircraft Corp., St. Louis, Mo. Gross weight is close to 12,000 lbs. Power to rotors is supplied by two 450 hp Pratt & Whitney engines. Equipment includes power winch for air rescue work.



**S4A** by Seibel Helicopter Co., Wichita, Kans. Will be produced for the Army carrying designation YH-24. Powered by a 125 hp Lycoming engine. Rotor diameter is 29 ft., weight empty 1000 lbs. Craft has a top speed of 75 mph and a range of 120 miles. Carries a crew of two.



**H-19** produced by Sikorsky Aircraft, Bridgeport, Conn. Navy designation HO4S, civilian S-55. Can carry 10 to 12 people and is the largest helicopter to see service in Korea; used for transportation of wounded and rescue work. Powered by 600 hp P&W engine located in the nose.



**Saro-Cierva Air Horse**, Saunders-Roe Ltd., Southampton, England. Has been specially developed for pest control work but will also be produced as 24-passenger transport, or as a freighter. Gross weight in vicinity of 17,000 lbs. Powered by a 1600 hp Rolls Royce Merlin engine.

When Igor Sikorsky took up his first experimental helicopter, the VS-300, in 1940 many prophets predicted that vertical-lift aircraft would never grow to a size necessary for a practical weight lifter. It might prove fine for personal transportation of four or five people at most, they said, but as a weight carrier—never. Ten years later the helicopter proved how wrong they were. Today there are machines in process of manufacture which can lift 40 passengers, and on less horse power than airliners of equal seating capacity. Though still slow, in comparison with fixed wing aircraft, the helicopter has the ability to take off and land at its actual destination, not some 10 miles from it, thus saving considerable time.

To the agile-acting helicopter, thousands of our wounded in Korea owe their lives, as only this type of craft was able to evacuate them from the rugged terrain of the Far Eastern battlefield. There are big things brewing for it in the near future, both in military as well as commercial transportation field.





**XA-6 Buck Private** designed by American Helicopter Co., Manhattan Beach, Calif. Powered by two pulse-jet engines of 35 lbs. thrust each, it approaches the utmost in design simplicity. Screw driver and crescent wrench are all the tools required for disassembly and maintenance.



**XHSL-1** by Bell Aircraft Corp., Buffalo, N. Y. Large tandem rotor helicopter to be used by Navy for anti-submarine warfare. Has a 2,000 hp Pratt & Whitney engine. Rotors incorporate Bell's famous stabilizing bar and can be folded for stowage on carrier hangar deck.



**LZ-4**, Doman Helicopters, Inc., Danbury, Conn. Has four-bladed rotor with hingeless flexible blades pioneered by Doman. Carries crew of two. Another LZ-5, a 5-6 place helicopter, will be built for Armed Forces under the designation of YH-31: ambulance and transport.



**Sero-Cierva Skeeter**, Saunders-Roe Ltd. Southampton, England. Small helicopter carrying crew of two, powered by 180 hp Blackburn Cirrus Bombardier. Mark 4 shown here is Navy version; civilian model has a 145 hp Gypsy Major. Diameter of blades 32 ft.

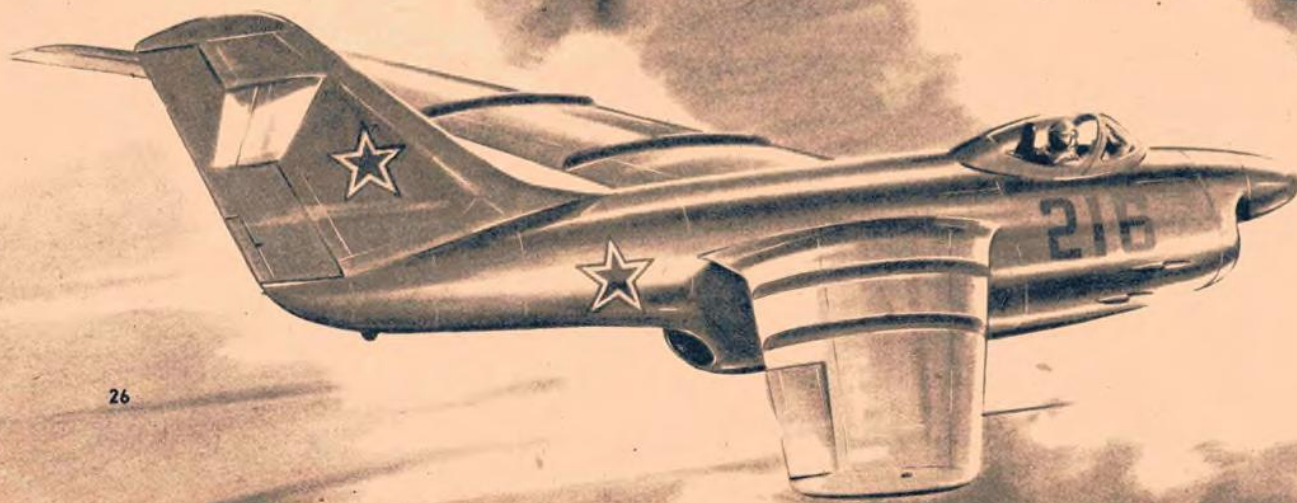


**Hiller Hornet**, Hiller Helicopters, Palo Alto, Calif. Powered by two ramjet engines each developing 31 lbs. thrust and weighing only 11 lbs. A stripped-down version of Hornet reached altitude of 7500 ft. Rotor diameter 23 ft. Top speed 80 mph. Range with two, 50 mi.



**HTK-1**, Kaman Aircraft Corp., Windsor Lock, Conn. Navy helicopter, featuring twin intermeshing rotor blades. Powered by 240 hp Lycoming engine, can carry 3 or 4. Converted to ambulance, accommodates one litter patient and one walking casualty in addition to pilot.







# "Inside Story" of MiG-19

By JAMES L. PECK

Illustrations by DeLANCEY

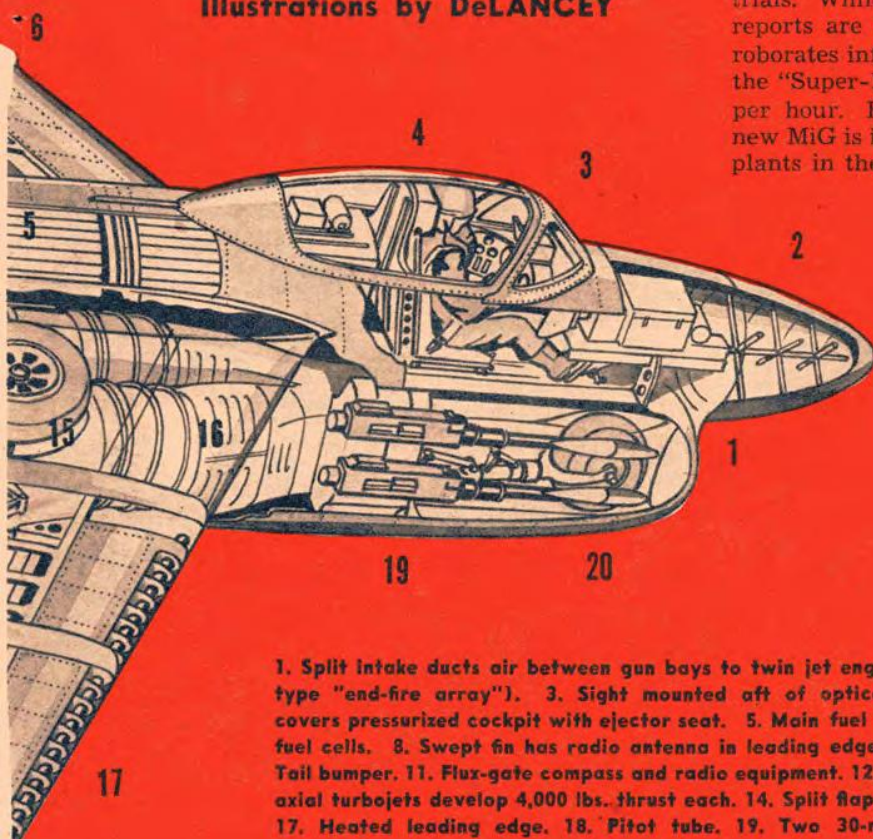
■ Revealed here for the first time is a technical reconstruction of the newest and hottest of Red Air Force fighters. This is the "Super-Mig."

This shark-faced MiG-19 is a bigger, faster, more heavily armed stable-mate of the now famous MiG-15. It is also more streamlined, more powerful, and is known to be equipped with a radar gunsight.

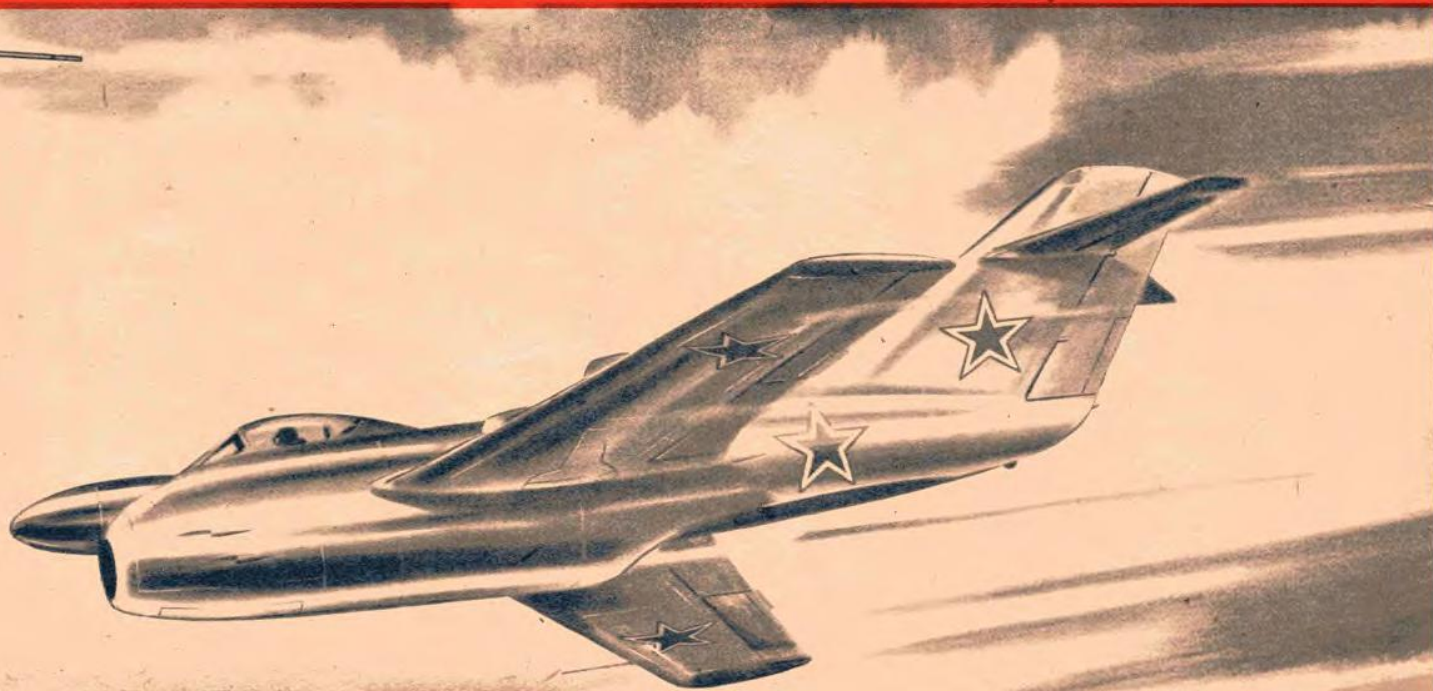
The "Super-MiG"-19 is a beautiful fighter which was first seen publicly at last Summer's Aviation Day display at Tushino Airport, and made its combat debut over Korea last October. This radar-nosed jet, is known to have appeared in "MiG Alley" several times since then in twos and fours—obviously for combat-evaluation trials. While camera gun pictures and official combat reports are Classified, word from the Sabre boys corroborates information from our sources to the effect that the "Super-MiG" is good for speeds well over 700 miles per hour. Highly reliable informants report that the new MiG is in production in limited numbers in two new plants in the Far East zone of the USSR.

Resembling superficially our McDonnell F-101 Voodoo fighter, the new Red job is powered by two axial turbojets mounted side-by-side in the bottom of the triangular-sectioned fuselage. Designed by Shvetsov, these are probably M-004H engines, developing some 4,000 pounds of static thrust.

The new MiG's wing appears to be a shoulder-wing installation, but it is actually a high mid-wing with the same general planform of the MiG-15 wing with double flow fences. It spans about 33 feet 6 inches. The slimmer, (Continued on page 72)



1. Split intake ducts air between gun bays to twin jet engines. 2. Gunsight radar antenna (Morgenstern-type "end-fire array"). 3. Sight mounted aft of optical flat in windscreen. 4. Jettisonable canopy covers pressurized cockpit with ejector seat. 5. Main fuel tanks. 6. Flow fences. 7. Interconnected wing fuel cells. 8. Swept fin has radio antenna in leading edge. 9. Tailplane is high-set with 45° sweep. 10. Tail bumper. 11. Flux-gate compass and radio equipment. 12. Jet ejectors set in fuselage "step". 13. Shvetsov axial turbojets develop 4,000 lbs. thrust each. 14. Split flaps. 15. Retracted main gear. 16. "Pants ducts." 17. Heated leading edge. 18. Pitot tube. 19. Two 30-mm cannon on each side. 20. Nose wheel well.





# Development Highlights



North American FJ-1 in foreground with its successor the FJ-2. Similar to F-86, FJ-2 has four 20-mm cannon.



Below: Twin-engine Navion, converted from standard model by Dauby Equipment Co. of Los Angeles, Calif., for use of Plastic & Rubber Products Co. Engines are two 125 hp Lycomings. Plane cruises 155 mph. Has larger fin and rudder area than regular Navion.



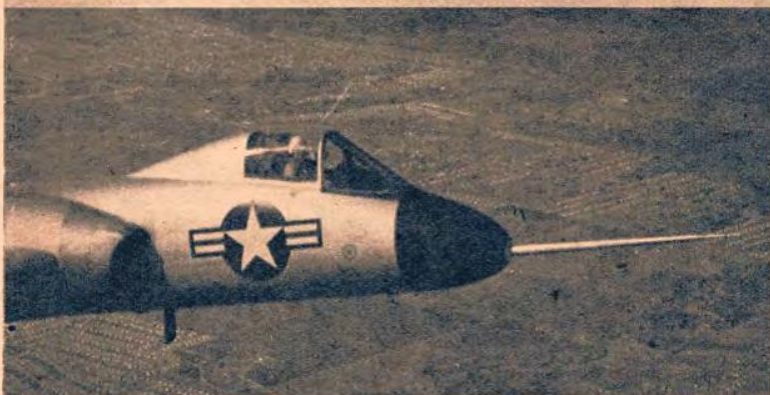




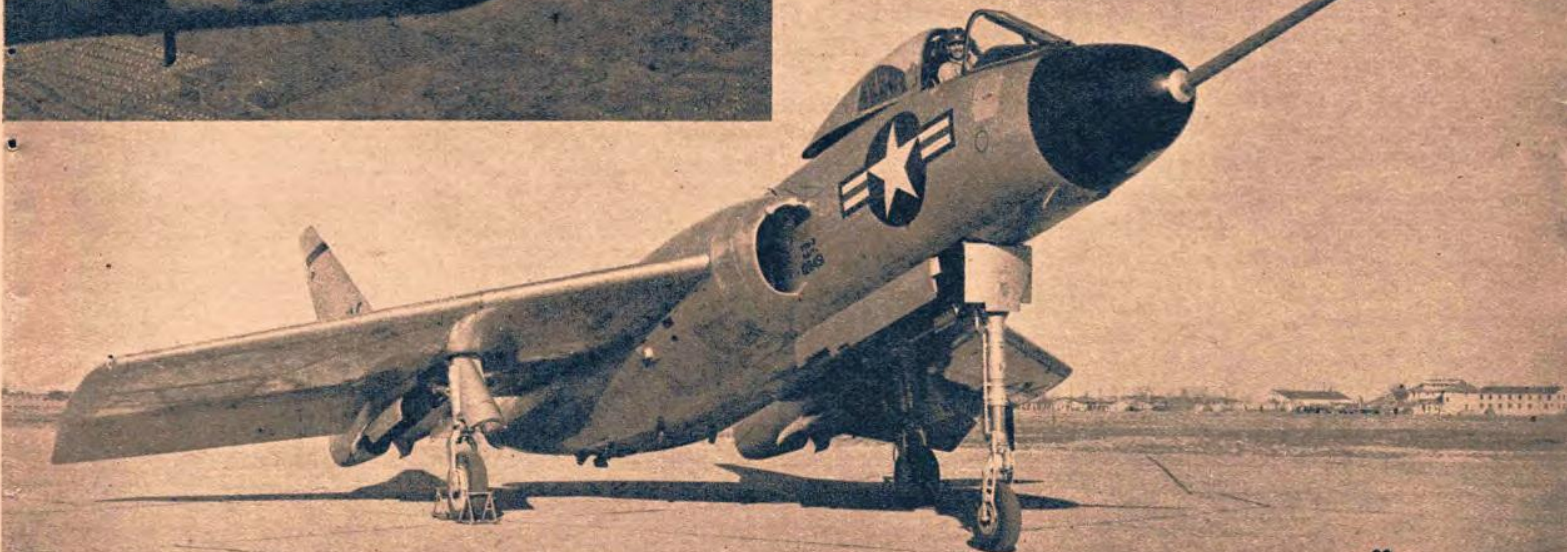
Latest product of Piper Aircraft Co. Piper-Twin Stinson, four-passenger light transport. Two Lycoming engines of 125 hp each.



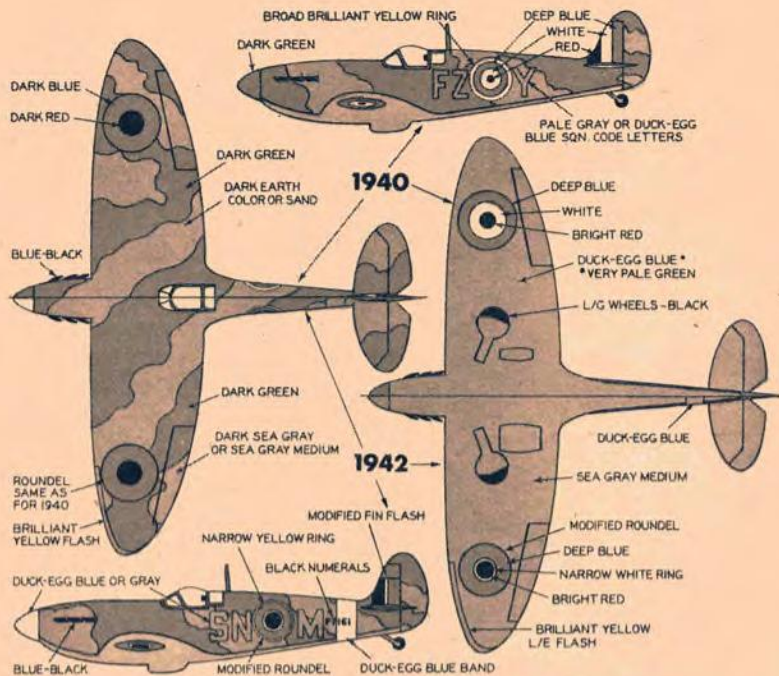
Another aeronautical curiosity, Twin-Cub by H. A. Wagner of Portland, Ore., using P-11 and J-3 fuselages. Two 85 hp engines.



Chance Vought F7U-3 Cutlass, a larger and more powerful version of the F7U-1. Some of the changes are shorter nose, elimination of sub-rudders, taller and slimmer vertical tail, roomier cockpit and larger engine nacelles to house the more powerful Westinghouse engines. Dimensions and performance of plane not revealed.





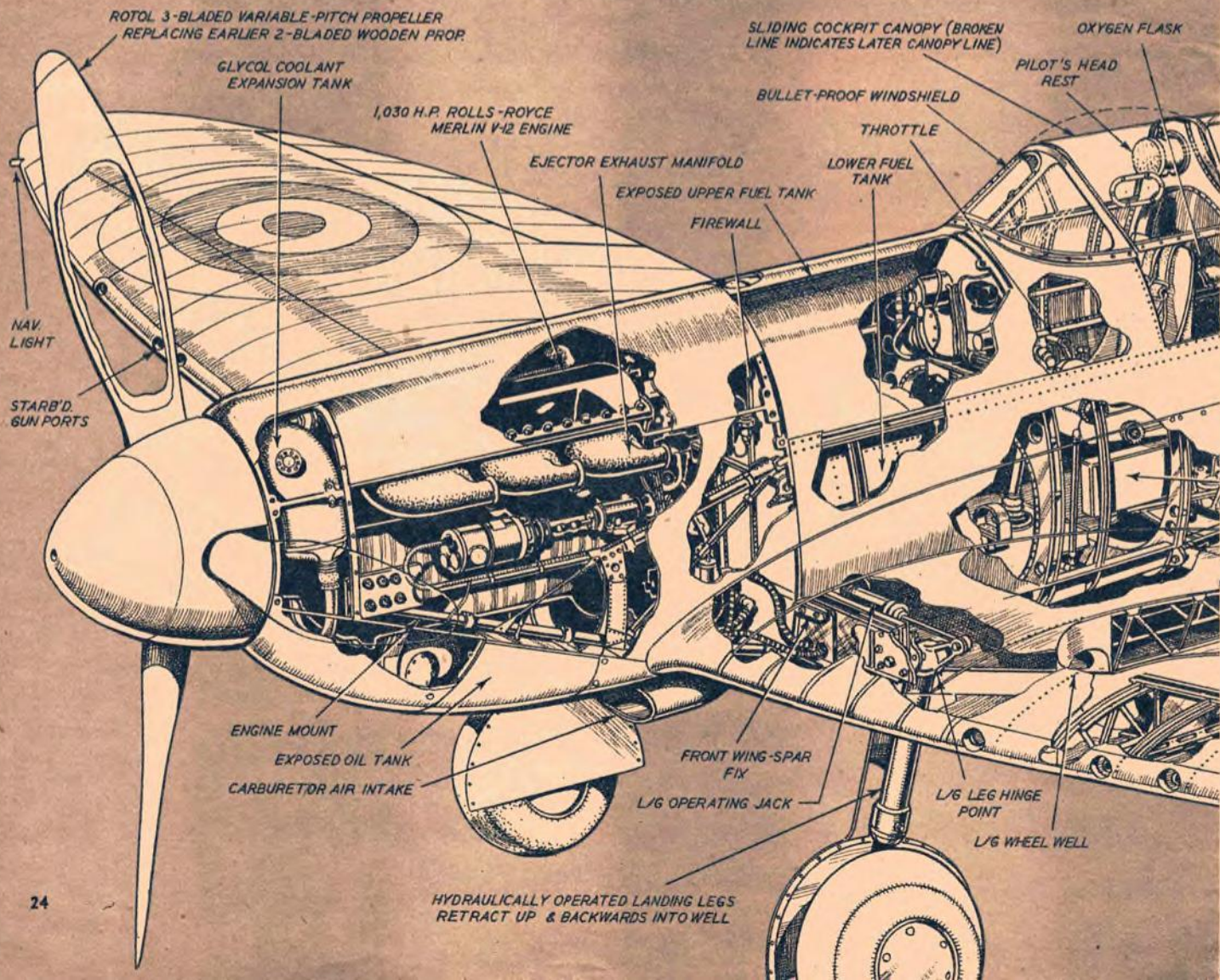


Top and bottom and profile views showing colors employed in 1940 (Battle of Britain) and in 1942. The 1940 camouflage, dark green and dark earth, was known as "Sand and Spinach." That of 1942, dark green and sea gray, was referred to as "Slime and Sewage." Main differences in markings indicated

# AIR PROGRESS

## Supermarine Spitfire

By DOUGLAS ROLFE



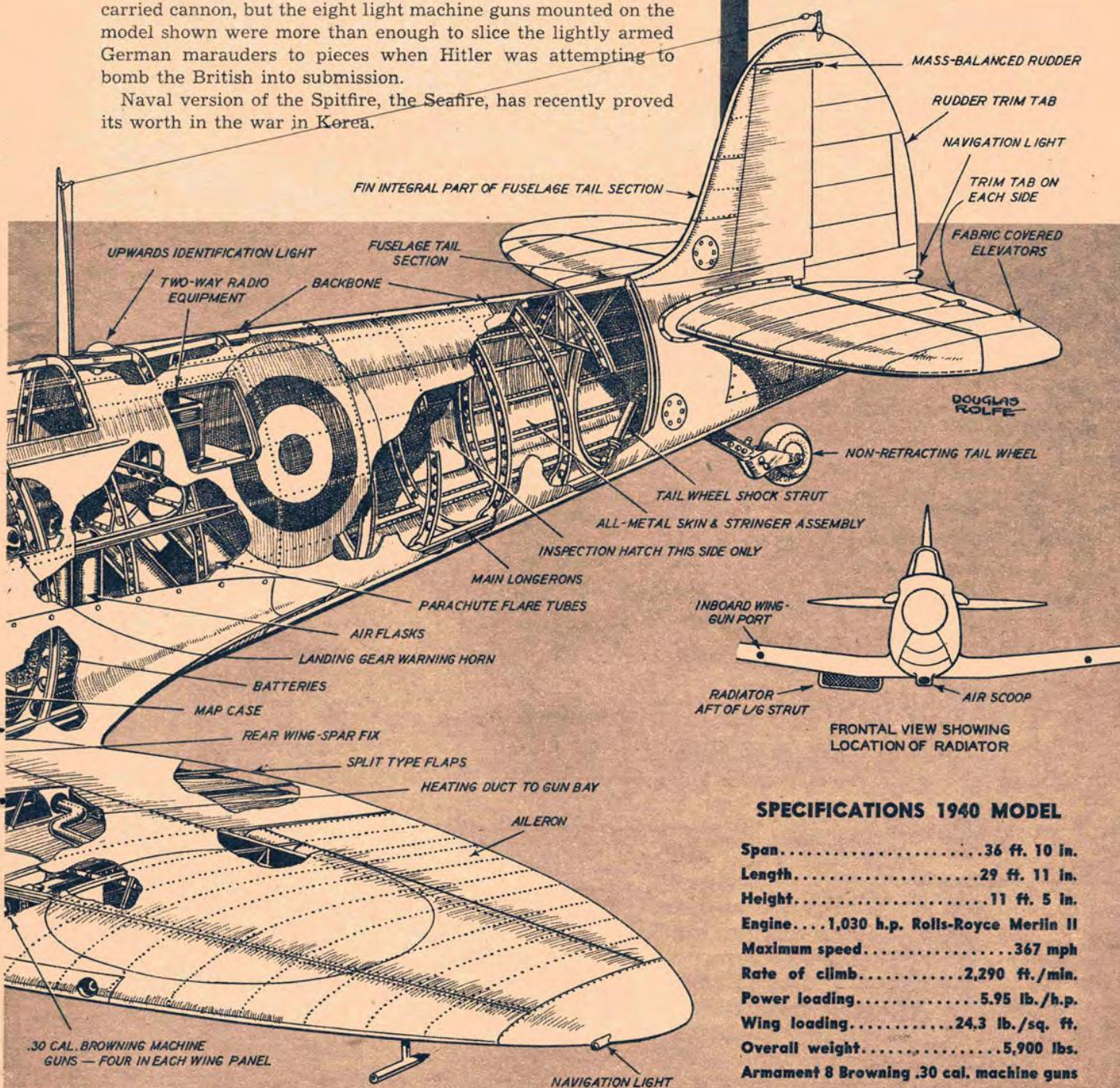
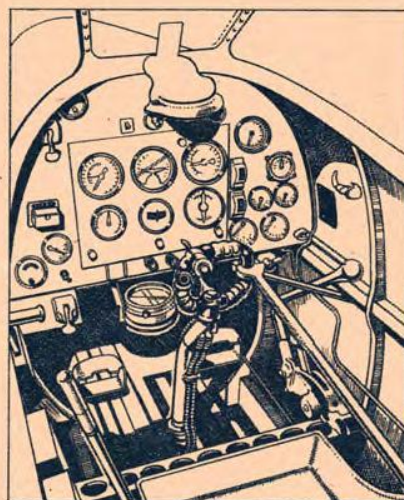


■ The fabulous Spitfire—top British fighter in the epic and decisive Battle of Britain—first appeared in 1936 but was not in production until 1939. Thereafter it remained the No. 1 British fighter throughout the Nazi war and is still today, in modified form, one of the world's best piston-engine fighters.

Designed by R. J. Mitchell, who was also responsible for the famous Supermarine Schneider Cup racers (first airplanes in the world to hit the 400 mile per hour mark), the "Spit" had a radical elliptically shaped wing which, while not so good from the production angle, was the focal point of the design and gave it its remarkable performance, especially in maneuverability.

The whole story of the development of the "Spit" will be told later in a further Air Progress story. Plane dissected here is the type in service during the fateful days of 1940. Later "Spits" carried cannon, but the eight light machine guns mounted on the model shown were more than enough to slice the lightly armed German marauders to pieces when Hitler was attempting to bomb the British into submission.

Naval version of the Spitfire, the Seafire, has recently proved its worth in the war in Korea.



#### SPECIFICATIONS 1940 MODEL

|                     |                                  |
|---------------------|----------------------------------|
| Span.....           | 36 ft. 10 in.                    |
| Length.....         | 29 ft. 11 in.                    |
| Height.....         | 11 ft. 5 in.                     |
| Engine....          | 1,030 h.p. Rolls-Royce Merlin II |
| Maximum speed.....  | 367 mph                          |
| Rate of climb.....  | 2,290 ft./min.                   |
| Power loading.....  | 5.95 lb./h.p.                    |
| Wing loading.....   | 24.3 lb./sq. ft.                 |
| Overall weight..... | 5,900 lbs.                       |
| Armament            | 8 Browning .30 cal. machine guns |



JULY 1952 • 35 CENTS

# Air Trails



**The Best Missiles  
are Morons!**



**Latest U. S. and Russian  
Jet Aircraft 3-Views**



**Model the Curtiss Falcon**



# AIR TRAILS

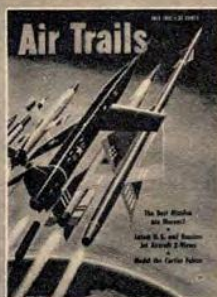
THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

**Editor:** Albert L. Lewis. **Technical Editor:** Alexis Dawydoff. **Editorial Production:** Carl Happel. **Art Director:** W. F. Tyler. **Editorial Assistants:** Rose Borello and Rosalba Accardi. **Special Correspondents—Washington:** Kendall K. Hoyt; **West Coast Modeling:** Dick Everett.

**STREET & SMITH PUBLICATIONS, INC.**  
President.....Gerald H. Smith  
Executive Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 2550 Beverly Blvd., Los Angeles 4, Calif.

July  
1952  
Vol. 38, No. 4



Cover—From R. to L.: Nike, Hermes, Matador, Lark, Loki, Snark. Painted by Frank Tinsley.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright, 1952, by Street & Smith Publications, Inc. 35c per copy. This issue is Vol. XXXVIII, No. 4. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FOR THE READER

- 8 We'd Like You to Meet
- 10 R/C Roundup—Howard G. McEntee
- 12 Air Notes
- 14 Airmen of Vision
- 16 Air Adventurers Club
- 19 The Best Guided Missiles Are Morons—David A. Anderton
- 22 The Pulitzer Race—Roger Huntingdon
- 24 Air Progress: Fokker Story—Rolfe
- 26 Russian Jet Fighters in 3-View—Bjorn Karlstrom
- 28 Curtiss Falcon—Walter A. Musciano
- 31 Real Gone Guys... Those Englishmen!
- 32 Air Model Pix
- 34 The Gopher—Herbert L. Davis
- 37 Propless Quartette—Drawings by Plecan
- 38 R/C Primer—Howard G. McEntee
- 40 Power Tools Speed the Job
- 41 National Record Glider—Bob Browner
- 44 Philly Whiz—Anthony J. Becker, Jr.
- 47 "AT" Forum
- 48 Cleveland's Quicky Bonanza
- 48 Dmeo's Live Wire
- 49 'Veco's Comanche
- 49 Helicopters' Hiller Hornet
- 52 You Can Jet Power Jim's Hornet
- 52 From Alpha to Zulu
- 54 The Civil Air Patrol Cadet
- 57 F.C.C. Field Offices
- 58 Dope Can—"Dopester"
- 60 Western Roundup—Dick Everett
- 63 Contest Calendar
- 66 Sketchbook
- 72 National Model Aircraft Records
- 76 Showcase

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**"Zoffig" Speed Job**... At a club meeting I was telling the fellows about a speed job I saw at Stewart AFB around 1947. It was a canard with a long, thin pencil fuselage with the engine buried. The prop was on an extended shaft which passed through a shaft tunnel in the gas tank. It was a real zoffig ship, believe me. The gang laughed at me, though. Can you back me up and supply any concrete info?

Norman Tate, Hempstead, N. Y.



• We can't supply much info, Norm, but here's a pictorial proof. We believe the ignition Arden was an .09.

**Built our R/C Unit**... I have constructed a receiver to your design as shown in the Annual and I am certainly pleased with the results. It is operated very satisfactorily in the Laboratory without any adjustment.

Carl F. Massopust, Gary, Ind.

**Assist from "AT" to ROTC**... Will you please forward me a tearsheet copy of the "100 3-views of World Airplanes", which appeared in the December, 1951 issue of Air Trails? These are for use in my Air Force ROTC class at the University of California.

Don Esacove, Los Angeles, Calif.

**Full-Size Plans**... I would like to thank you for your plan service. The full-size plans are more than a help—they give a very clear and concise picture of just how each part should be made and put together to

make a thing of beauty out of a pile of wood, paper and wire.

I am very much pleased with the plans of Cal Smith. I have made his AD-2, AT-6 and many others that he drew. I like his cover designs also—that boy is OK for my money even if he is an Air Force boy ("I'm Navy").

R. Hansen, San Lorenzo, Calif.

... Have a new Air Trails plan #1151 that's never been used, would like to trade with someone having a new or used plan #651. My plan includes: Douglas Mailplane; F/F Glutton; Half-A Stunt Chum; ROG-ROW combo sport F/F. The plan I want contains Stits Jr.; Half-A Flying Boat; Douglas AD-2 Navy Carrier event winner. If they don't want to trade I will gladly buy it from them. Thank you.

Jim Minor, 4530 23rd Ave. So., St. Petersburg, Fla.

**Precedent for Pack Plane**... This letter is in regard to the Fairchild XC-120 Pack Plane. Unless I am mistaken you had a similar idea on the cover of your issue of either the July or August Air Trails in 1948.

Dean Wray, Dayton, Ohio

• AT's "pack plane" was presented before word came of the Fairchild project.

**Navy's Color**... Could you please tell me the regulation Navy color? I'm building an F6F Hellcat, and am sort of stumped on its color.

Bill Hess, North Olmsted, Ohio

• Regulation Navy color for aircraft is dark blue.

**Fairey Jr. Lightplane**... In your article "The Ultra Lights of England" there was a picture of the Fairey Jr. plane which is designed for home building by amateurs. Could you supply me with information as to where I could obtain further details?

Jack Bowyer, Iola, Kans.

• We suggest that you write to Avions Fairey, S.A., Gosselies Charleroi, Belgium.

### SUBSCRIPTION PRICE

\$3.50 per year in U.S. and Possessions; \$4.50 per year in Canada; \$7.00 per year in countries of the Pan American Union; \$10 elsewhere.

### NOTICE TO SUBSCRIBERS

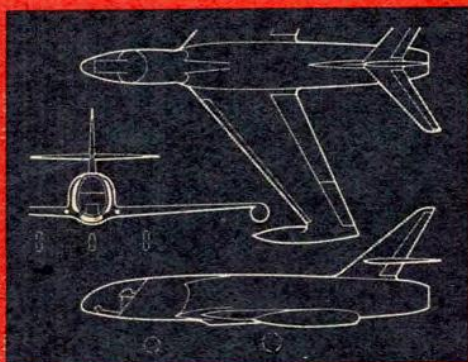
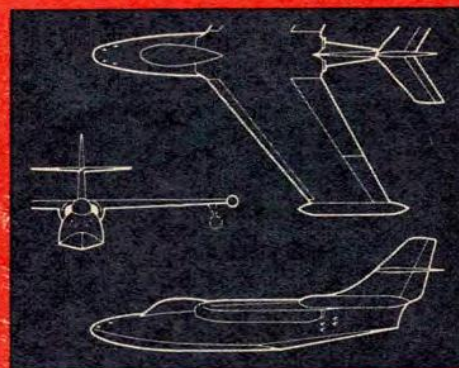
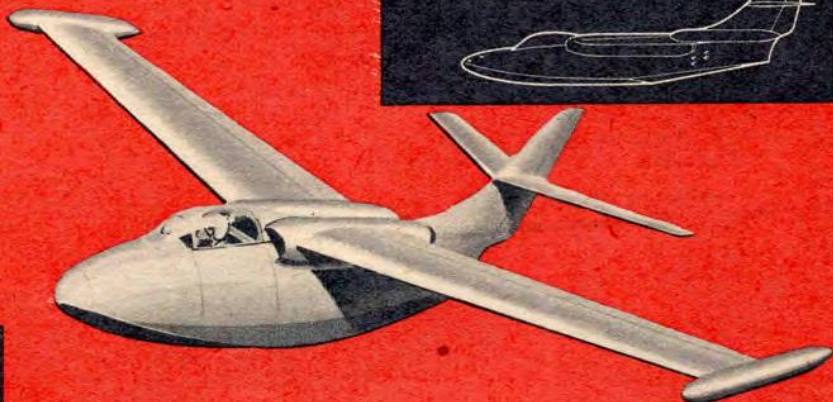
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



# Airmen of Vision

## DESIGN COMPETITION

USAF's Lt. William F. Gottwald, stationed in Europe, gets this month's medal for best design. The aircraft is an all-weather jet interceptor or attack, powered by two engines of 5200 lbs. thrust each. Catapulted from naval vessels it lands on water. Permanent tip tanks are lowered to act as stabilizing floats. The plane has four 20-mm cannon.



Charles R. Hitz of Bellingham, Wash., came up with a novel idea in two-place all-weather fighters by locating both pilot and radar observer in prone position, one above the other, thus giving the plane's nose an excellent streamline shape. Entire front section is jettisonable capsule, lowered by parachute. Speed 700 mph.



High-speed medium bomber by Bob Ward of Calgary, Canada. Powered by one 10,000 lb. thrust turbojet and two ramjets on wing tips. General design is similar to the German Me. 163 rocket fighter, neither a flying wing nor a tailless design, but one which proved quite successful. Carries crew of four, is armed with six cannon in the nose and two two-gun retractable turrets on top and below fuselage. Wingspan is 100 ft., total length 115 ft. Cabin pressurized for high altitudes. Speed 600 mph.



Air-Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any usual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





# The **Best** Guided Missiles are **Morons**

**An entirely new concept in warfare: a weapon with a single-track brain whose only object is to kill. Its complex nature will present many a pretty problem.**

■ The final success of our guided missile program will depend on our ability to create a mechanical moron.

We must build metallic monsters with low-order intelligence, with one-track minds. And we must condition the missile mind with a single impulse—the destruction of the enemy.

It will take that kind of a moron to do the most effective job in missile warfare. The missile must obey—without thinking or reasoning—the most recent command it has been given. It must consider only current data, and not learn by remembered experience. Judgment or objective analysis of the situation is not a factor. It has been told to go out and kill, and that's what it does, even though it's a suicide task.

It may come as somewhat of a shock to think of the guided missile in terms of arrested development. We usually think of all the electronic gadgetry under its hide as "brains" and we tend to credit the missile with intelligence it doesn't have. That kind of thinking is really force of habit. We've seen every new electronic control described

as a "brain." We've read about the many euphoniously named computers, those machines that think. And gradually we've been conditioned to the point where our jaws drop in amazement over any machine which performs a simple task any small child could do.

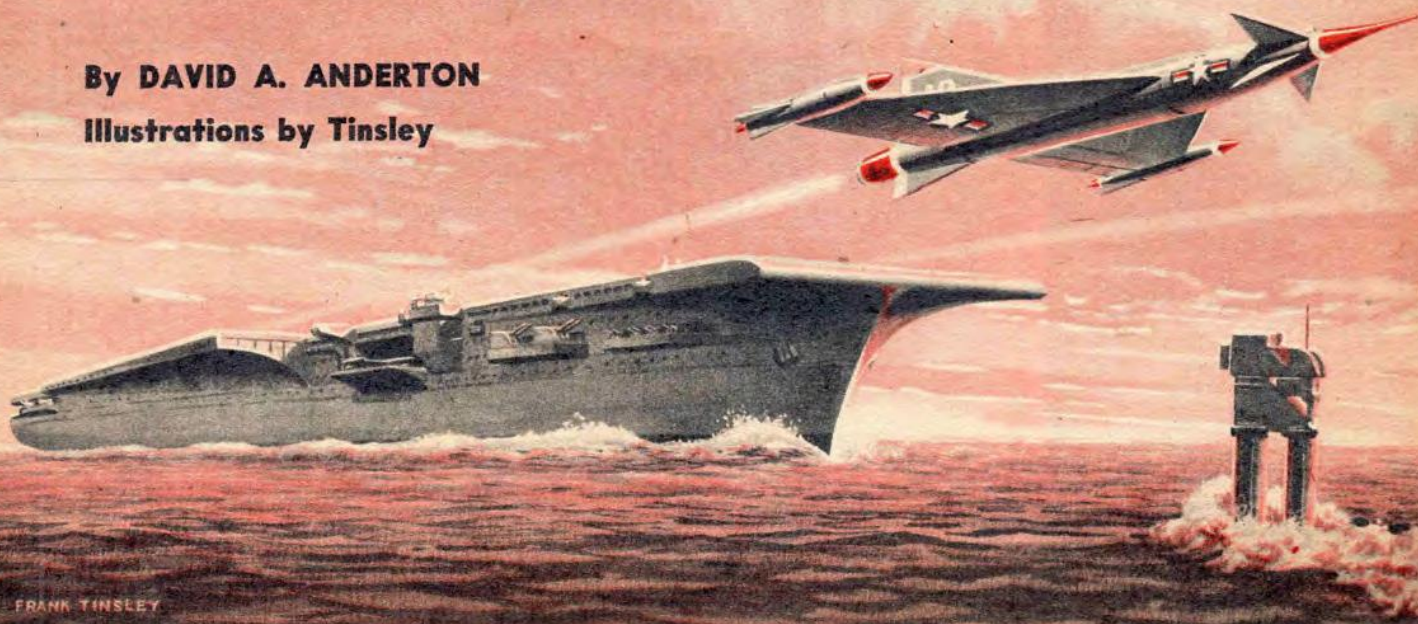
That isn't right, of course. A machine which can count or obey a command may be pretty high up the intelligence scale for a lifeless gadget, but on the human scale, it's pretty low. A child, a dog or a horse can generally duplicate the same motions, also on command.

In building guided missiles, we are fated to be judged by the ability of the brain we produce, and not by the amazing brawn. In a way, our case is parallel to that of Dr. Frankenstein.

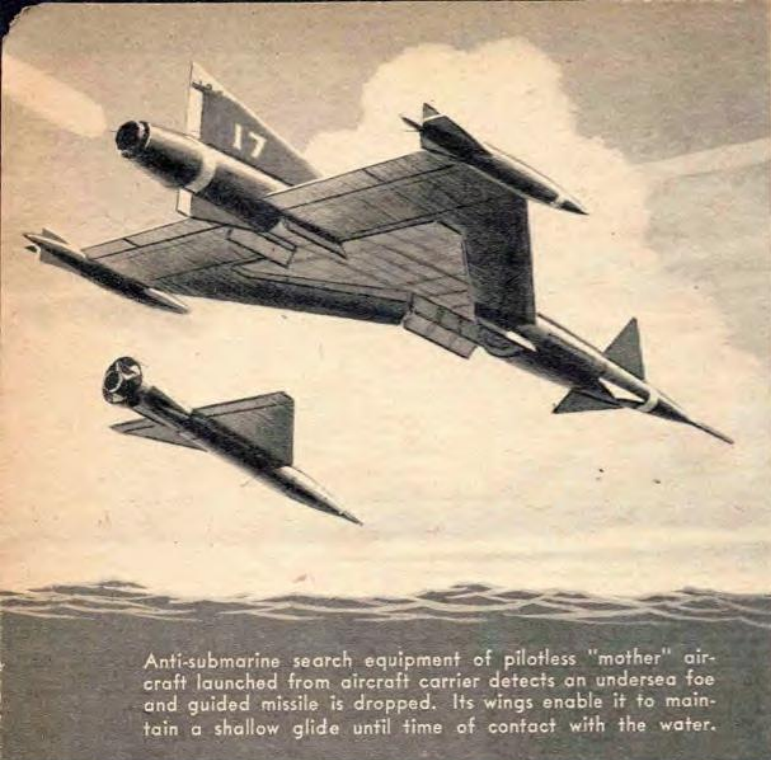
You remember the story. Frankenstein was a medical student who created a monster. It was his misfortune to get the brain of a criminal to install in his creature's skull. And it was his fate to be judged by the evil that his creation did. Nobody remembered—or cared—that Frankenstein showed his genius in the synthesizing of a

By **DAVID A. ANDERTON**

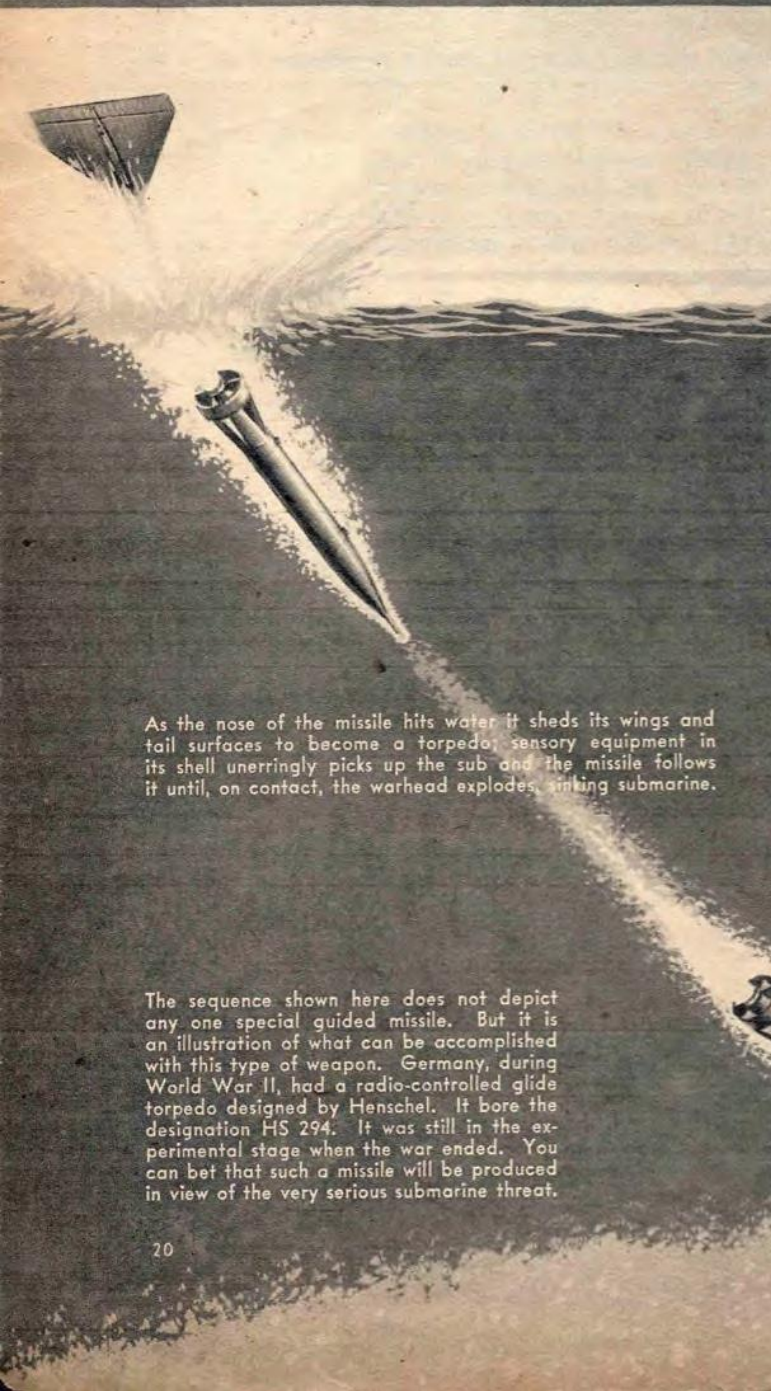
Illustrations by **Tinsley**







Anti-submarine search equipment of pilotless "mother" aircraft launched from aircraft carrier detects an undersea foe and guided missile is dropped. Its wings enable it to maintain a shallow glide until time of contact with the water.



As the nose of the missile hits water it sheds its wings and tail surfaces to become a torpedo; sensory equipment in its shell unerringly picks up the sub and the missile follows it until, on contact, the warhead explodes, sinking submarine.

The sequence shown here does not depict any one special guided missile. But it is an illustration of what can be accomplished with this type of weapon. Germany, during World War II, had a radio-controlled glide torpedo designed by Henschel. It bore the designation HS 294. It was still in the experimental stage when the war ended. You can bet that such a missile will be produced in view of the very serious submarine threat.

human body. Its ingenuity did not matter.

So it will be with our missile work. We will give our metal children magnificent bodies that will operate oblivious to extremes of heat and cold, pressure and vacuum, gravities and lifts. We will give them motive power derived from the stored energy in chemical fuels, released at temperatures which can melt steel. And everybody will overlook the design genius shown in these phases of the creation. Instead, they'll peer into the cranial cavity, see a collection of black boxes, and murmur, "Isn't that wonderful?"

Well, it is and it isn't. It takes a lot of work to build an idiot. You slave with pencil and slide rule. You build components in the shop, test them in complicated circuitry. You redesign them so they can be produced. And then you get the whole works set up in a missile—and what have you got?

Your mountain of engineering effort has brought forth a mental mouse. You've got a brain which literally can't think. It is incapable of reason. It can only obey what it is told to obey, and then only if that particular act of obedience has been conditioned into the brain.

As an example of what we're talking about, take the case of a long-range missile which operates at normal aircraft altitudes. Nobody has ever told it that there might be an airplane in the way sometime. Instead it was given a ground target to recognize and hit. Even if its radar eyes saw a plane, it might still blindly ram it. The missile was never told to avoid it, and the ability to avoid was not built in.

You can rightly ask why the designer of the missile didn't foresee that collision. There's a chance he did, and that he figured the probability of the accident. It was one in some astronomical number, and so he decided it really wasn't worth it to build in that particular element of self-preservation. He decided it wasn't worth it because the brain already weighed about 100 pounds and took up about three cubic feet. By contrast, your brain—capable of rational thought and action—weighs about three and one-half pounds and takes up about one-tenth of a cubic foot.

So let's drop the idea of a missile brain. It doesn't think for itself. It doesn't reason things out. It doesn't obey the most primal instinct of self-preservation.

Instead it's a motivating core or a motion controller or something else. It sits there blank and its sensory organs tell it that the missile is too high or too low or too far left. And so it responds long enough to obey the command and then lapses into the blankness again. During its brief life it may be called on



to open valves or close throttles or kill itself. It does one just as easily as it does the other.

Actually there are varying degrees of intelligence required of these missile "brains." We can start with a simple kind that can only read a clock. Every few seconds, a time impulse causes the brain to do something. Now we can complicate that clockwork with a radio command signal from the ground. We could give signals to cut off the fuel flow, if the missile got out of hand after launching. Or we could watch as it approached an enemy bomber, and detonate it when it was close enough.

Then we can get fancier and fancier, adding task after task. But the more you feed into it, the more chance there is of having something snap. It's easier to overload a smarter brain than a dumber one. The men who work with computing machines know this. They have reported that some of the more-complicated brains, those which have to do more than merely count, show some near-human tendencies. They get off to a slow start after a weekend; they get tired after a long day of work; they even have the electro-mechanical equivalent of a nervous breakdown.

But if you keep the brain simple and give it a minimum of understanding, you never have trouble. And that's another reason for creating a moron—you can't afford to have the thing get a nervous breakdown.

We've talked a lot about this control core of the missile. The reasons are plain, or should be, by now. The missile can only do what it is told to do. The more clearly you give that information, the more explicitly everything is spelled out for the dumb brain, the better it does its final job.

But we ought to talk a little about that job, because the duties of a guided missile determine the kind of control you build into it.

First off, the guided missile is getting complicated and expensive. That means you're not going to be building thousands of them for mass raids on enemy targets. You can't afford to. Instead, you are going to concentrate on getting a missile so accurate and so thoroughly proved out in tests that you stand just about 100 percent chance of hitting the target right on the X. And that kind of a missile is going to cost money.

So we've got to use those expensive missiles to do certain particular jobs that we can't do with other weapons or weapon systems at our disposal. Take the anti-submarine problem, for example.

Right now it takes a task force to catch a sub. Current ASW techniques require a carrier with its escort and its planes, the latter split into hunter-

killer teams. These aircraft use sonar, depth charges, bombs, rockets and guns, depending on what the sub does. Sometimes they ring in a blimp, or additional surface vessels. The total bill to kill that submarine is a big one.

Suppose instead you cross the submarine torpedo with a pilotless aircraft—then you've got the weapon to sink the sub. You still have to find the sub, and that's a job for underwater detection equipment. And you've got to get the missile to the sub, and that's a job for an aircraft of some kind. Let's try it this way:

To each convoy or naval task force is attached a squadron of pilotless scout aircraft. Each one is equipped to fly long-time patrols. Each craft is loaded with fuel, radar and underwater sound gear and other kinds of special equipment. And in a bomb-bay in its belly nestles a little missile—the hybrid winged torpedo.

These scout craft fly endless patrols over the fleet. They weave a continuous grid over the ships. There are always enough of the scouts in the air to cover the entire task force and the fringe area around it. When one of the scouts begins to run low on fuel, automatic controls tell it to turn back; the craft is landed back on the aircraft carrier with an automatic landing system.

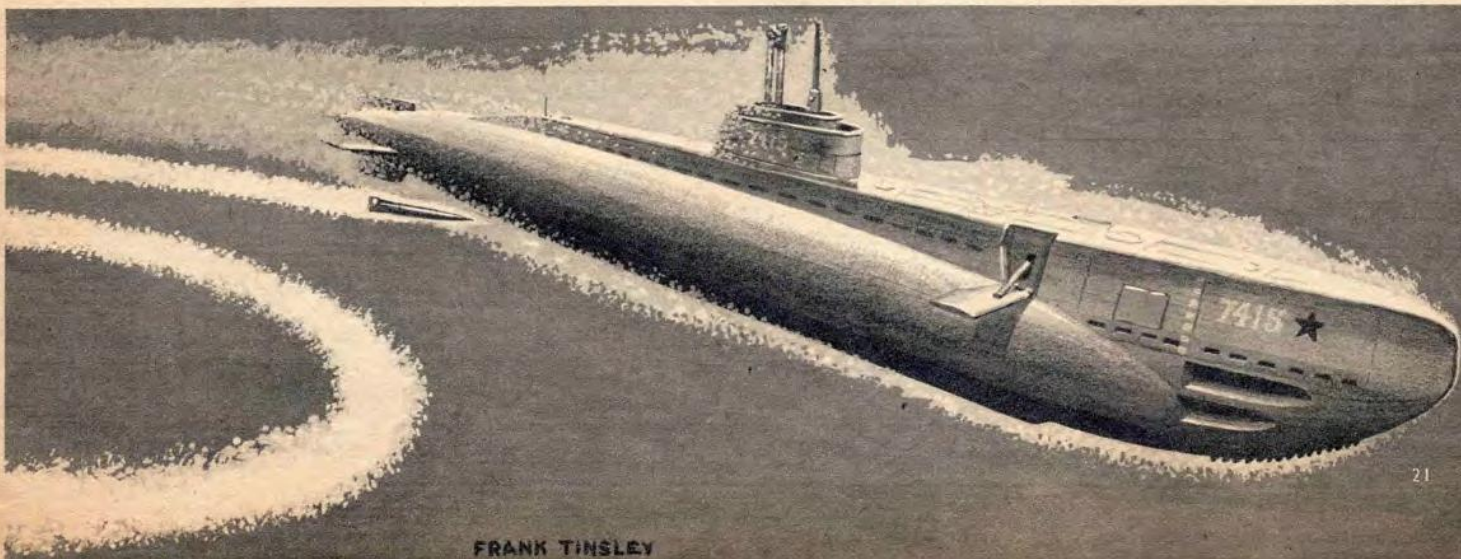
When one of the scouts sights a sub on its own radar, its bomb-bay doors open. The little torpedo slides out and streaks for the water. Midway in its flight there is a sharp roar and a sustained bellow as its rocket motor is fired by a proximity fuse. The missile picks up speed, accelerating to supersonic velocity just as it hits the water.

The impact shears off its wings. Down through the depths it drives, with rocket motor still firing and thrusting it further through the water at high speed. Then it slams into the sub hull, tears through the blister and penetrates to the inside, to blow itself, sub and crew into a tangled mess of oil and steel and flesh.

That's one kind of a special job that a missile can do. There's another that we might look at now. It stems from the things we learned about bombing during the Second World War. It always seemed that the Germans made very rapid recoveries after bombing raids. Within a few weeks, factories were back in production and schedules suffered only a little.

We learned that factories didn't stay hit.

One of the reasons for that might be the way you build modern factories. You build a rugged foundation of reinforced, poured concrete, dug into the ground and supported well on all sides by the earth. On top of this there are brick or concrete walls, and they are spanned with steel (*Continued on page 71*)





# AIR PROGRESS

By DOUGLAS ROLFE

NOTE: PRONOUNCED DIHEDRAL  
SECURED LATERAL STABILITY

FIRST FOKKER - THE "SPIDER" - FLEW IN 1911. ▲  
NO PROVISION WAS MADE FOR LATERAL CONTROL

▲ Fok. E.IV THIS EARLY FIGHTER  
WROUGHT SUCH HAVOC AMONGST  
ALLIED AIRMEN IN 1915 THAT IT WAS  
DUBBED "THE FOKKER SCOURGE"

◀ MOST DREADED FOKKERS ▲  
OF WORLD WAR I WERE THE DR-I  
TRIPLANE AND THE D.VII BIPLANE  
WHICH INTRODUCED CANTILEVER  
THICK-SECTION WINGS IN AN AGE  
OF EXTERNALLY BRACED PLANES

◀ Fok. S.I (U.S. DESIGNATION,  
TW-4), PRODUCED 1920-22, WAS  
A 2-SEAT SIDE-BY-SIDE BASIC  
TRAINER WITH CURTISS OX5 ENG.

▲ NOTE: OF THE FEW F-8 S TO REACH THE  
FRONT SEVERAL BROKE UP IN MID-AIR —  
KILLING SOME OF THE TOP GERMAN PILOTS

Fok. D.XI (U.S. DESIGNATION, PW-7) THIS ▲  
1922 FIGHTER IS REMINISCENT OF THE CUR-  
TISS XPW-9B HAWK—HAD SAME D-12 MOTOR  
AS HAWK BUT WAS A CANTILEVER BIPLANE

▲ Fok. D.X (U.S. DESIGNATION, PW-5) 335 H.P.  
WRIGHT H-2 AND OTHER ENGINES, WAS A DE-  
VELOPMENT OF THE F.VI PRODUCED IN 1920

Fok. F.IV (U.S. DESIGNATION, T-2)  
ONE OF THESE SHIPS PILOTTED BY  
LIEUTS. MACREADY AND KELLY, U.S.  
A.A.S. MADE 1ST NON-STOP TRANS-  
CONTINENTAL FLIGHT (FEB. 22-23  
1921). ENGINE WAS A 420 H.P. LIBERTY

ARMY AIR SERVICE  
NON STOP  
COAST TO COAST

A.8.64233

FG.II GLIDER WAS WORLD'S FIRST 2- ▲  
PLACE MOTOR-LESS DESIGN AND HUNG UP  
SEVERAL ENDURANCE RECORDS (1922-23)

◀ Fok. B.II APPEARED  
IN 1923—WAS POWERED  
WITH A ROLLS-ROYCE  
EAGLE ENGINE, HAD ALL-  
METAL HULL & FLOATS

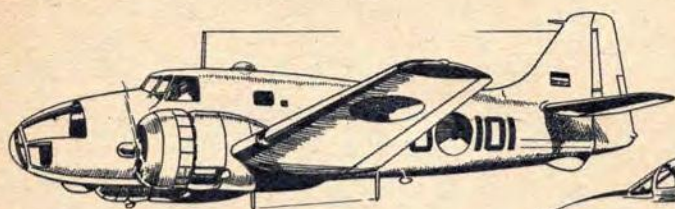
## THE FOKKER STORY

One of the most colorful figures ever associated with air progress was the remarkable Dutchman, Anthony Gerard Fokker. Forward-thinking designer, inventor, brilliant airplane and glider pilot, successful manufacturer and in-

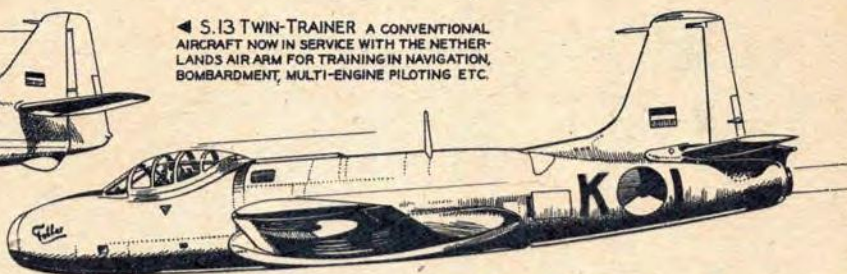
defatigable promoter of the Fokker wares, he invented the synchronized gun gear, introduced welded steel tube airframes and pioneered in cantilever self-stressed wings. His planes were produced in 14 countries; flew on 40 airlines.

Fokker designed, built and learned to fly on his first plane in 1911 at the age of 21. After vainly trying to interest the Dutch and British military authorities in his planes he won





◀ S.13 TWIN-TRAINER A CONVENTIONAL AIRCRAFT NOW IN SERVICE WITH THE NETHERLANDS AIR ARM FOR TRAINING IN NAVIGATION, BOMBARDMENT, MULTI-ENGINE PILOTING ETC.



▲ S.14 JET FIGHTER INDICATES PRESENT-DAY FOKKER COMPANY'S ABILITY TO CONTINUE HIGH STANDARDS OF DESIGN SET BY ITS FOUNDER



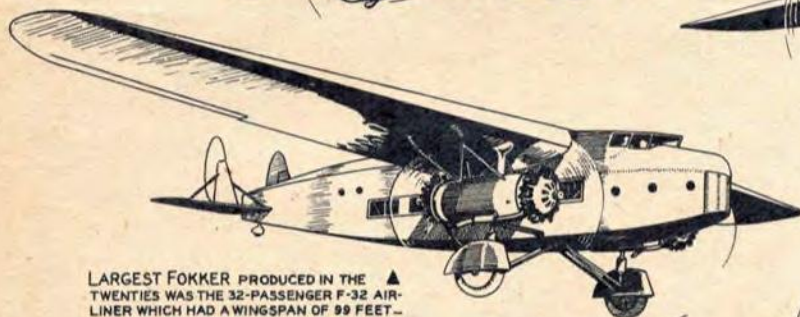
▲ LAST PRE-WAR TYPES WERE THE D.23 FIGHTER AND A MID-WING HEAVY BOMBER PRODUCED IN EARLY 1939 ▼



S.11 INSTRUCTOR IS ONE OF ▲ THE RE-ACTIVATED FOKKER COMPANY'S RECENT DESIGNS—A NEAT LITTLE MILITARY OR CIVIL TRAINER



FOKKER SUPER UNIVERSAL FIRST ▲ SPECIALLY DESIGNED, U.S. BUILT FOKKER

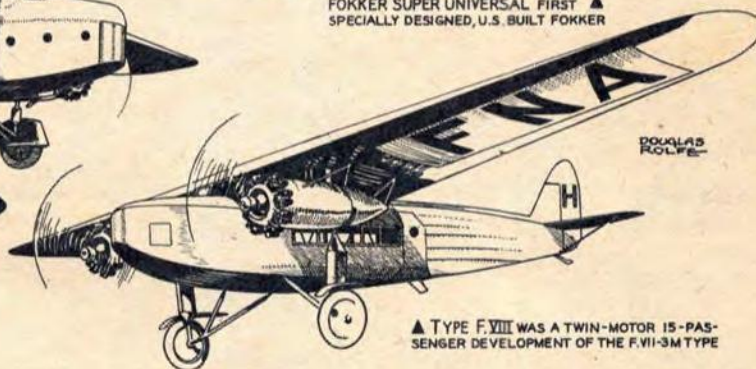


LARGEST FOKKER PRODUCED IN THE TWENTIES WAS THE 32-PASSENGER F-32 AIRLINER WHICH HAD A WINGSPAN OF 99 FEET — AND WAS POWERED WITH FOUR 525 H.P. ENGINES



PLYWOOD SKIN WINGS

▲ D.XIV FIGHTER, ALSO A 1925 DESIGN, SERVES TO POINT UP THE AMAZING DIVERSITY OF TYPES INTRODUCED DURING THIS PERIOD



DOUGLAS GOLFE

▲ TYPE F.VIII WAS A TWIN-MOTOR 15-PASSENGER DEVELOPMENT OF THE F.VII-3M TYPE



INTERNALLY SPRUNG WHEELS

F.VII B-3M (SAME AS F.VIIA-3M ▲ BUT WITH SOMEWHAT BIGGER WING)



TYPE F.VIIA ▲

◀ WORLD'S FIRST TRI-MOTOR WAS STANDARD 8-PASSENGER F.VII-A AIRLINER EQUIPPED WITH TWO ADDITIONAL ENGINES HUNG FROM THE WINGS.— IT WAS DESIGNATED THE F.VIIA-3M AND FIRST APPEARED IN 1925.— FIRST FLIGHTS FROM SAN FRANCISCO TO HONOLULU AND AUSTRALIA (IN 1927 AND 1928 RESPECTIVELY) AND MANY OTHER EPOCH-MAKING TRANS-OCEANIC FLIGHTS WERE ACHIEVED WITH THIS TYPE OF FOKKER AIRCRAFT WHICH IN COMMON WITH MOST FOKKER DESIGNS OF THE PERIOD, WAS VARIOUSLY POWERED — BEING EASILY ADAPTABLE TO A WIDE VARIETY OF RAD. ENGINES

first prize at the German military trials of 1913, and with a contract for 10 planes in his pocket set up a modest factory at Schwerin, Germany, the same year.

With the defeat of Germany and the harsh terms of the 1918 Armistice threatening his future, Fokker managed to sneak his entire factory equipment and many finished planes over the border into his native Holland, where the existing

Fokker Company was immediately established.

In 1927 the U. S. Fokker Company was founded and later turned over to General Motors. The parent company carried on until Holland was overrun by the Nazis in 1940. Now, despite the interim death of its founder, the Fokker Company is once more engaged in designing and building aircraft worthy of the Fokker tradition.



AUGUST 1952 • 35 CENTS

# Air Trails

Aviation  
and  
**MODEL  
PLANES**



**Construction Details of the Flying Saucer ▶**  
**FLYING BATTLESHIPS OF THE USA and USSR!**  
**BOB PALMER'S "SMOOTHIE" SUPER STUNT MODEL**



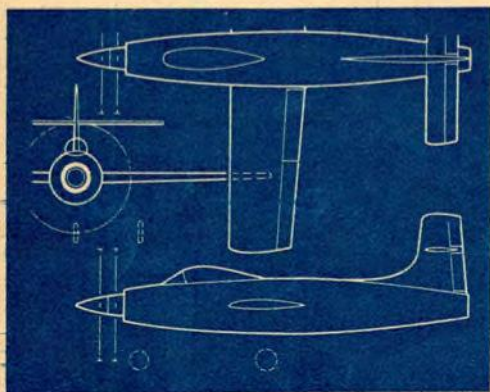
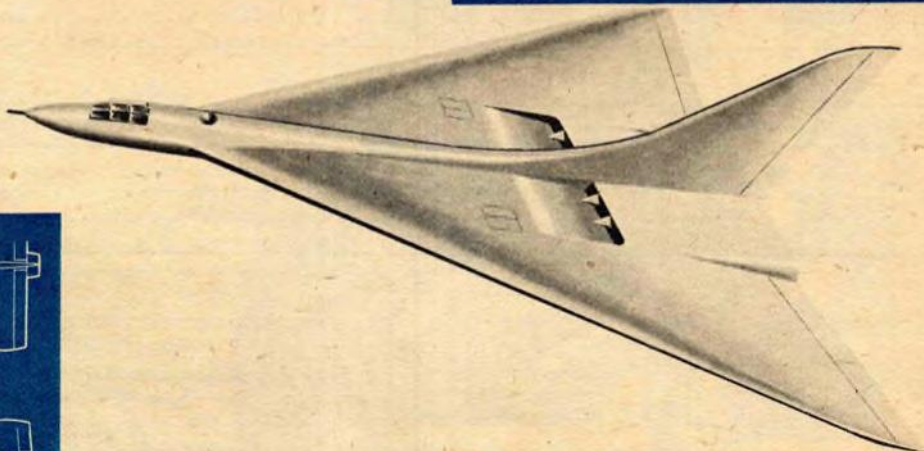
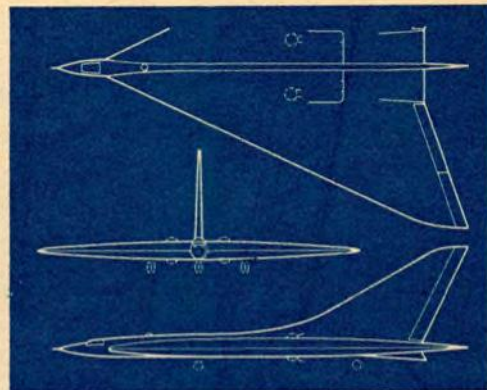
See Page 44



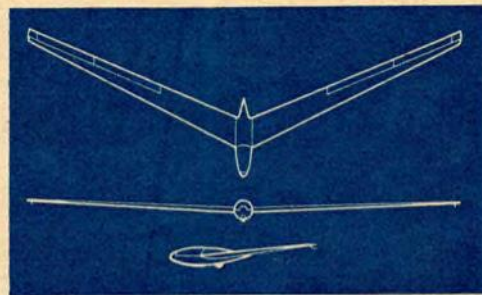
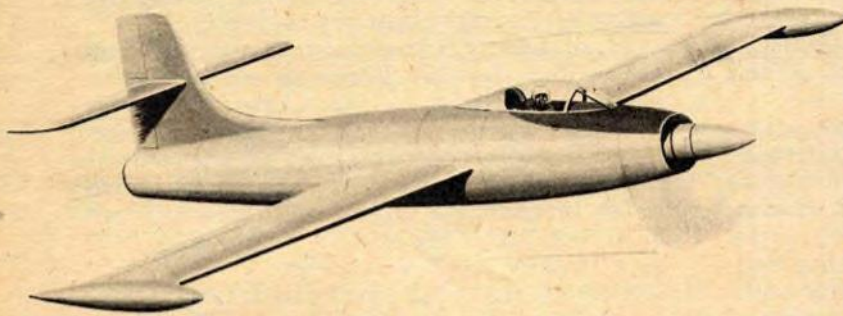
# Airmen of Vision

## DESIGN COMPETITION

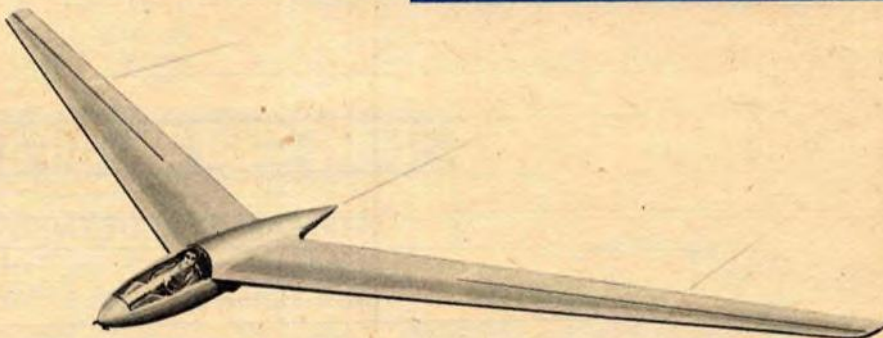
Intercontinental delta bomber by William E. Lang of Baltimore, Md., was selected as this month's best design. It is designed to operate at high altitudes and is powered by six 7000-lb.-thrust turbo-jet engines and one 10,000-lb.-thrust rocket. Maximum bomb load is 32 tons, range 8000 miles, top speed 800 mph. Landing gear doors serve as flaps. Wingspan is 131 ft., length 148 ft. Ceiling 70,000 ft.



High-altitude interceptor by D. Rodenburg of Nijmegen, Holland. It is powered by a turboprop engine of 6000 hp driving two contrarotating propellers. Additional thrust is obtained from exhaust leading out of tail pipe. Armament consists of four 25 mm cannon firing through propeller arc. Span 40 ft., length 40 ft. Speed 700 mph.



Flying wing sailplane by Robert Eldridge of Bakersfield, Calif. The wing is of all-wood construction, plywood covered. It is not unlike the German Horten IV glider, with very high aspect ratio wing which has a span of 48 ft. Fuselage is made from wingtip tank. All controls are at the trailing edge, yaw being accomplished by small sections at the tips which act as drag spoilers. Top speed is 90 mph.



Air-Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½ x 11 inches for the entire three-views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any usual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The design may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.

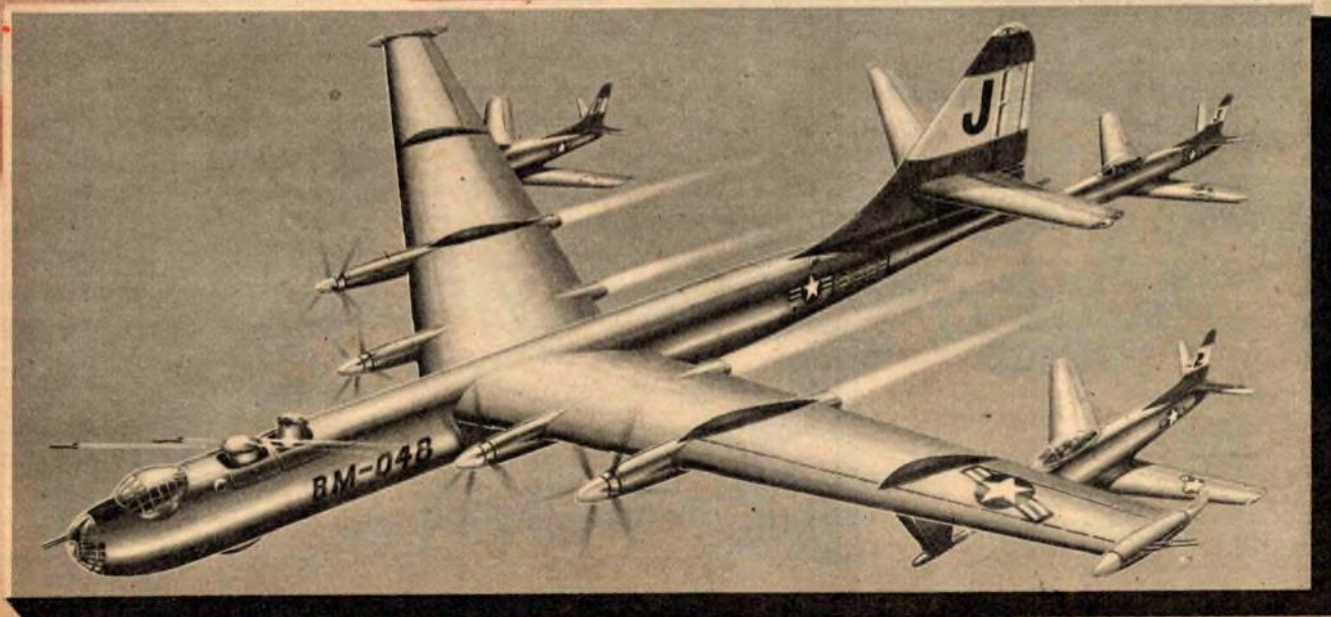


# Flying Battleships of the USA and USSR

Illustrated by FRANK TINSLEY

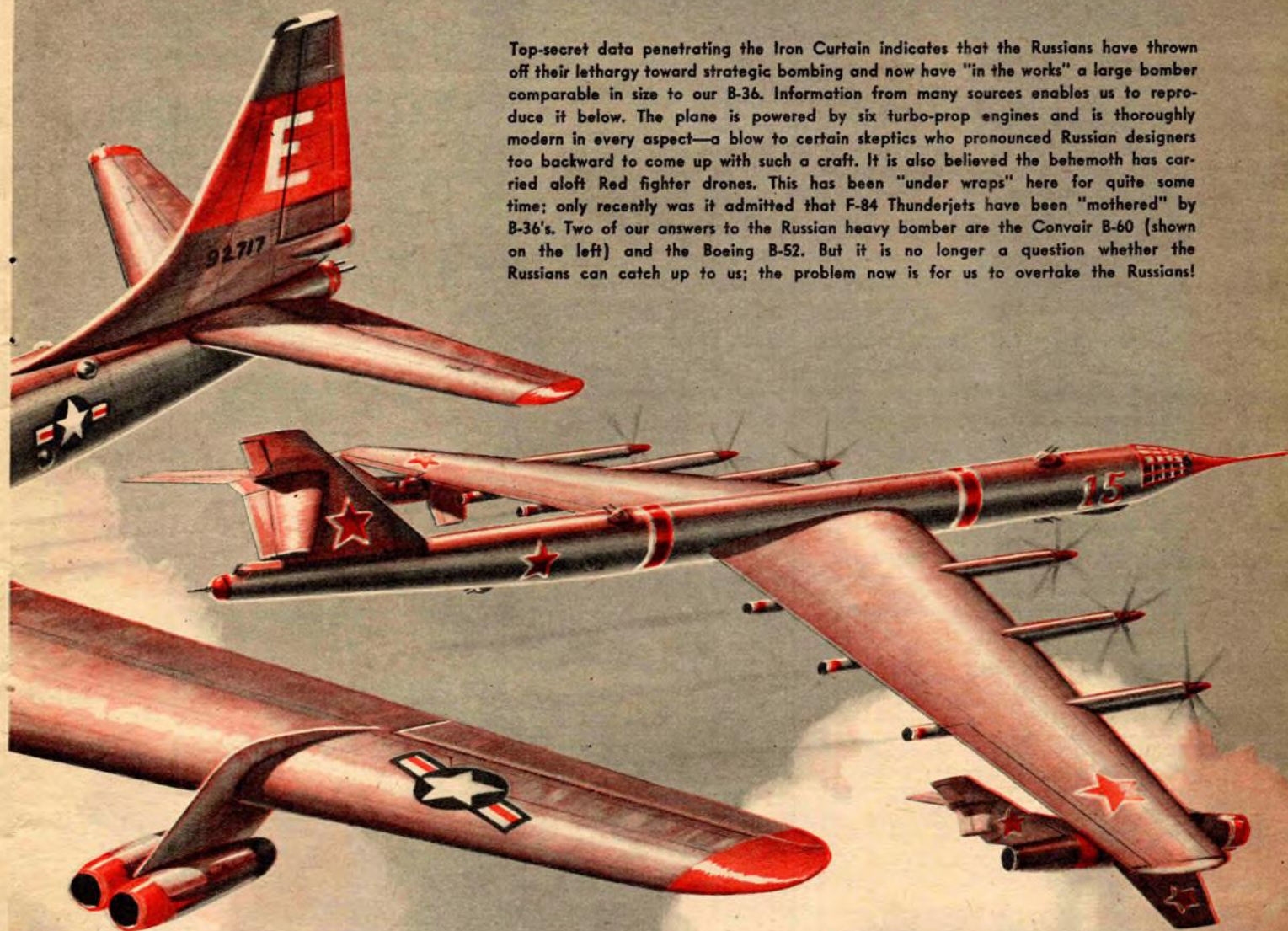


AT's impression of swept-wing B-36 appeared in July 1950 Issue. At that time AF was considering turbo-prop engine power for the aircraft.

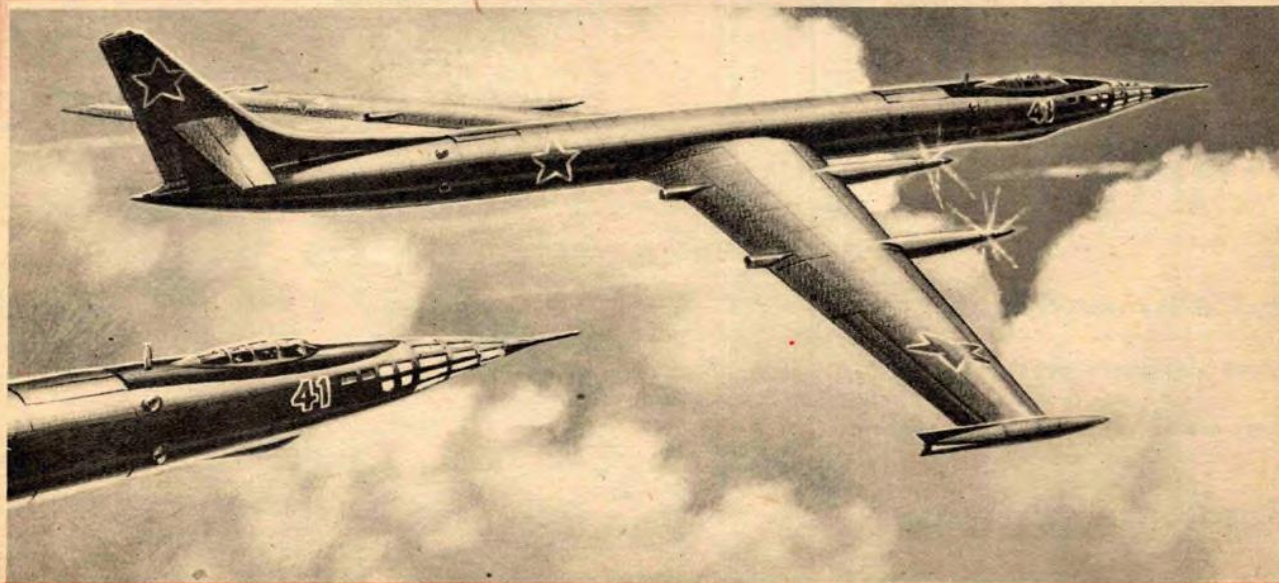




Top-secret data penetrating the Iron Curtain indicates that the Russians have thrown off their lethargy toward strategic bombing and now have "in the works" a large bomber comparable in size to our B-36. Information from many sources enables us to reproduce it below. The plane is powered by six turbo-prop engines and is thoroughly modern in every aspect—a blow to certain skeptics who pronounced Russian designers too backward to come up with such a craft. It is also believed the behemoth has carried aloft Red fighter drones. This has been "under wraps" here for quite some time; only recently was it admitted that F-84 Thunderjets have been "mothered" by B-36's. Two of our answers to the Russian heavy bomber are the Convair B-60 (shown on the left) and the Boeing B-52. But it is no longer a question whether the Russians can catch up to us; the problem now is for us to overtake the Russians!



In July 1951 AT published this preliminary sketch of Russian heavy bomber. Note close resemblance to latest concept above.





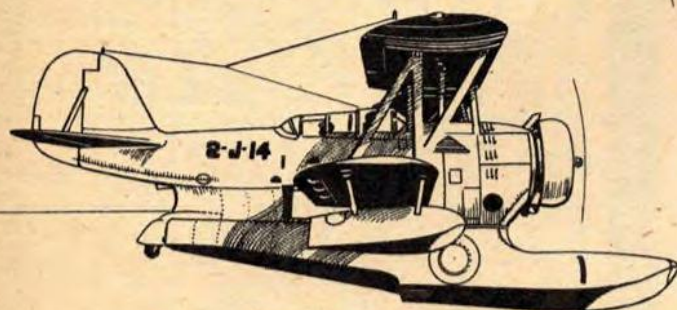
# AIR PROGRESS

By DOUGLAS ROLFE

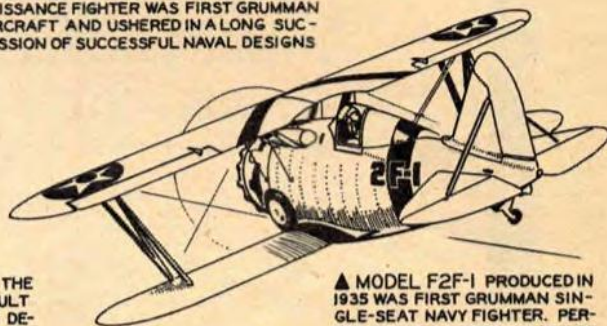
## THE GRUMMAN STORY



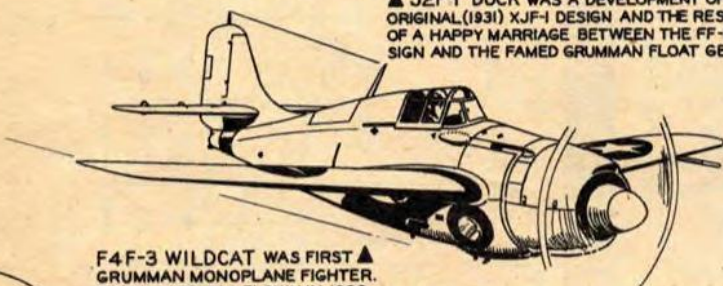
▲ MODEL FF-1 ALL-METAL DECK RECONNAISSANCE FIGHTER WAS FIRST GRUMMAN AIRCRAFT AND USHERED IN A LONG SUCCESSION OF SUCCESSFUL NAVAL DESIGNS



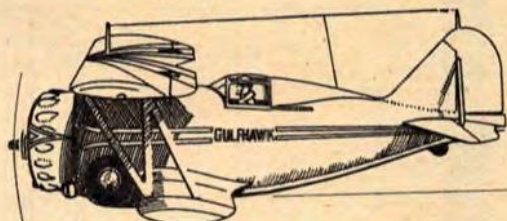
▲ J2F-1 DUCK WAS A DEVELOPMENT OF THE ORIGINAL (1931) XJF-1 DESIGN AND THE RESULT OF A HAPPY MARRIAGE BETWEEN THE FF-1 DESIGN AND THE FAMED GRUMMAN FLOAT GEAR.



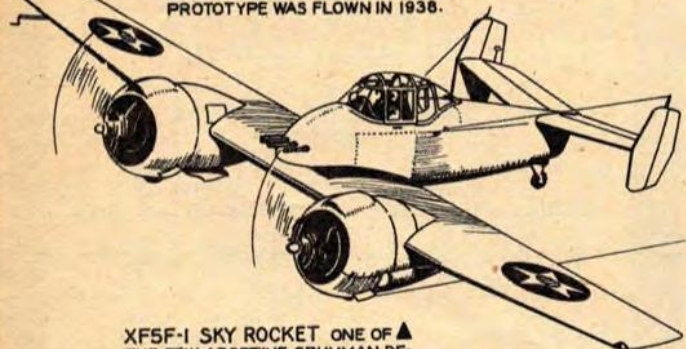
▲ MODEL F2F-1 PRODUCED IN 1935 WAS FIRST GRUMMAN SINGLE-SEAT NAVY FIGHTER. PERFORMANCE WAS TOPS IN ITS DAY



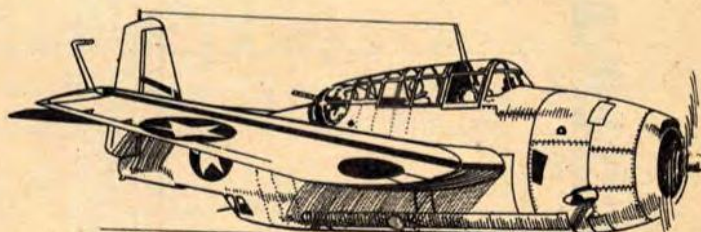
F4F-3 WILDCAT WAS FIRST ▲ GRUMMAN MONOPLANE FIGHTER. PROTOTYPE WAS FLOWN IN 1938.



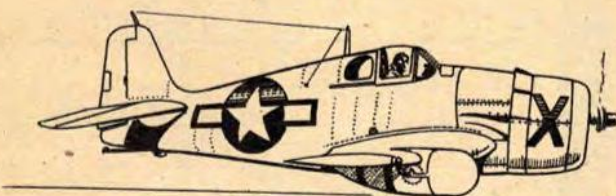
MODEL G-22 (BELOW) WAS COMMERCIAL VERSION OF THE F2F-1 (ACTUALLY HAD F3F-1 FUSELAGE, F2F WINGS). WAS BUILT EXPRESSLY FOR MAJOR AL WILLIAMS.



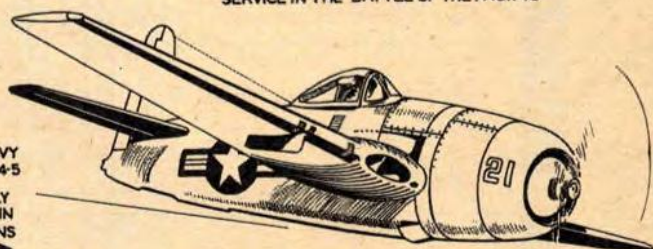
XF5F-1 SKY ROCKET ONE OF ▲ THE FEW ABORTIVE GRUMMAN DESIGNS BUT AN INTERESTING TYPE.



▲ TBF-1 AVENGER CARRIER-BASED TORPEDO-BOMBER. — IT DID YEOMAN SERVICE IN THE BATTLE OF THE PACIFIC



▲ F6F-5N HELLCAT FIRST GRUMMAN LOW WING NAVY FIGHTER AND SCOURGE OF THE JAPANESE AIR ARM IN 1944-5  
F8F BEARCAT WAS MORE POWERFUL BUT CONSIDERABLY LIGHTER THAN THE HELLCAT — IT WENT INTO PRODUCTION IN 1945 — TOO LATE TO ESTABLISH ITS SUPERIOR QUALIFICATIONS AS A FIRST-LINE CARRIER BASED U.S. NAVY FIGHTER ►►

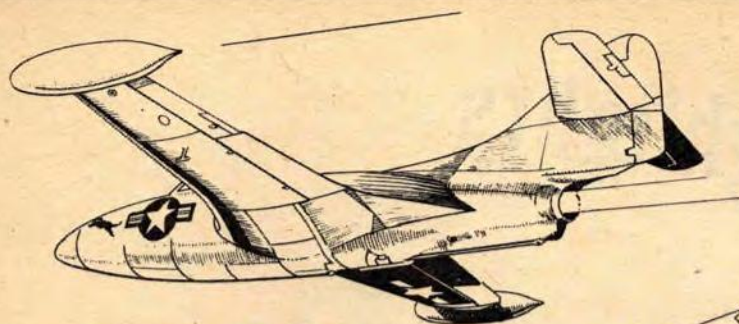


The Grumman Aircraft Engineering Company set up shop in a small garage located at Baldwin, L. I., in January 1930—just as the great depression got under way. First products were limited to replacements for the then popular Loening Amphibian, and as the depression continued they even resorted to the manufacture of dural truck bodies. But all this

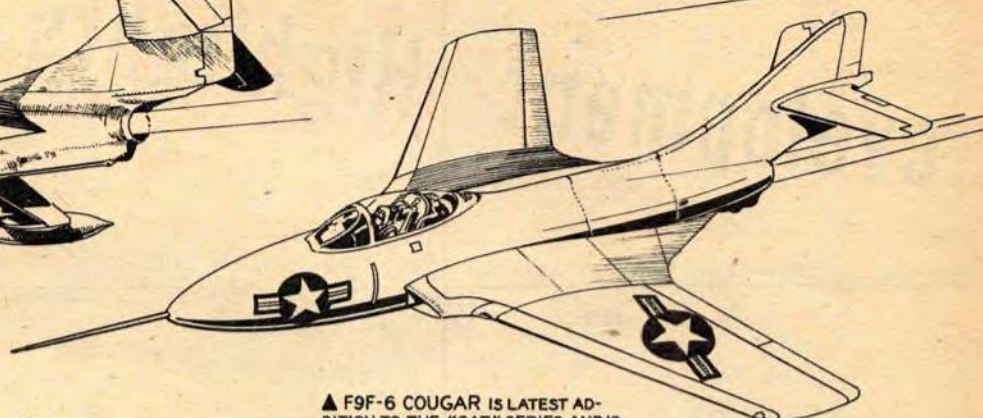
time they were working on the development of a radically improved amphibious float gear which finally elicited the attention of the Navy and resulted in a contract sufficiently large to enable them to produce the first Grumman designs.

These appeared in 1932—all Navy types—and from that time on the U.S. Navy has rarely been without a preponder-

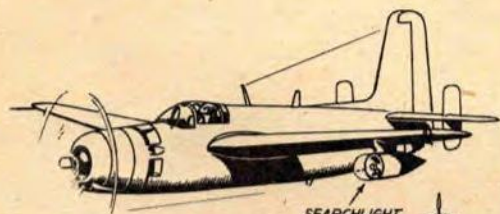




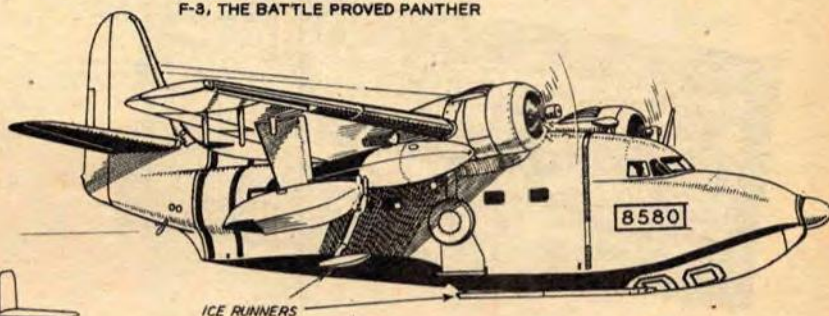
F9F-3 PANTHER FIRST JET ▲  
FIGHTER TO BE USED IN COMBAT  
BY THE U.S. NAVY AND CURRENT-  
LY EMPLOYED IN THE KOREA WAR  
IT IS ONE OF THE BEST OPERATIONAL  
JET FIGHTERS IN THE WORLD



▲ F9F-6 COUGAR IS LATEST AD-  
DITION TO THE "CAT" SERIES AND IS  
SWEEP WING SUCCESSOR TO THE F9-  
F-3, THE BATTLE PROVED PANTHER



AF-2S GUARDIAN  
"KILLER" VERSION

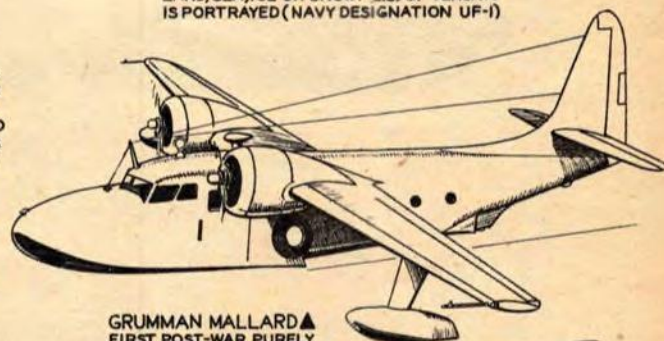


SA-16A ALBATROSS TRIPHIBIAN ▲  
AIR RESCUE CRAFT CAN OPERATE FROM  
LAND, SEA, ICE OR SNOW. U.S.A.F. VERSION  
IS PORTRAYED (NAVY DESIGNATION UF-1)

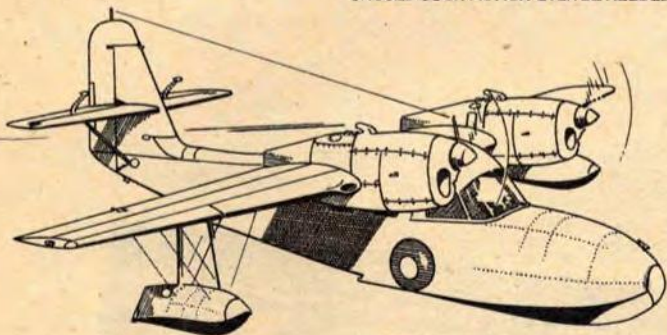


AF-2W GUARDIAN  
"HUNTER" VERSION

▲ GRUMMAN GUARDIAN - WORLD'S  
LARGEST SINGLE-ENGINE AIRCRAFT, IT IS  
DESIGNED TO COMBAT HOSTILE SUBS.  
"HUNTER-KILLER" TEAMS OF TWO WOULD  
FIND AND DESTROY ENEMY SUBMARINES  
SHOULD SUCH ACTION EVER BE NEEDED



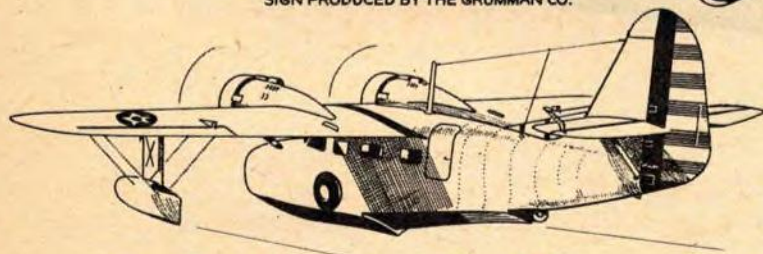
GRUMMAN MALLARD ▲  
FIRST POST-WAR PURELY  
COMMERCIAL AMPHIBIAN



G-44 WIDGEON APPEARED IN 1939 ▲  
TO BECOME SECOND COMMERCIAL DE-  
SIGN PRODUCED BY THE GRUMMAN CO.



▲ F7F-3N TIGERCAT PRODUCED IN 1943 IT  
CAME BETWEEN THE HELLCAT AND THE BEAR-  
CAT - WAS ALSO A CARRIER-BASED FIGHTER



◀ OA-9 GOOSE. MILITARY VERSION OF THE  
MODEL G-21 - FIRST (1937) COMMERCIAL GRUM-  
MAN DESIGN AND FORERUNNER OF A NOTABLE  
SERIES OF MEDIUM SIZE AMPHIBIOUS BOATS

DOUGLAS  
ROLFE

ance of Grumman aircraft. In fact, during the years 1934-1939, all U.S. Navy single-seat fighters were of Grumman origin, and even today the Navy still leans heavily on this first-class firm for its airplane equipment.

Record of Grumman aircraft during World War II was outstanding—the Hellcat alone contributing heavily to the

containment and final destruction of the Japanese air arm. Today the Grumman Panther jet fighter has already established a notable record in the Korean air war.

In the commercial field the Grumman plane has an equally excellent reputation—particularly in the field of amphibious aircraft in which it remains preeminent.

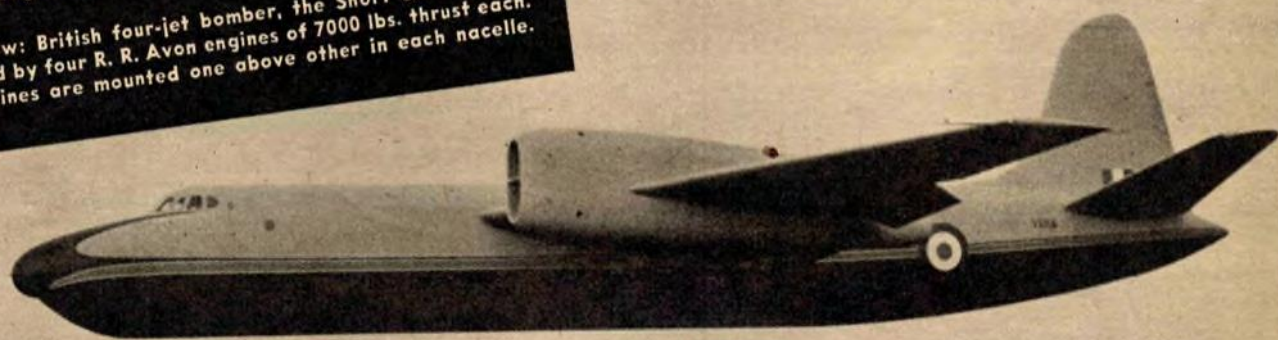


# Development Highlights



Boeing YB-52 taking off on its first flight. Its eight jet engines develop 50,000 lbs. of thrust. Span is 185 ft., length 153 ft. and height to top of rudder 48 ft.

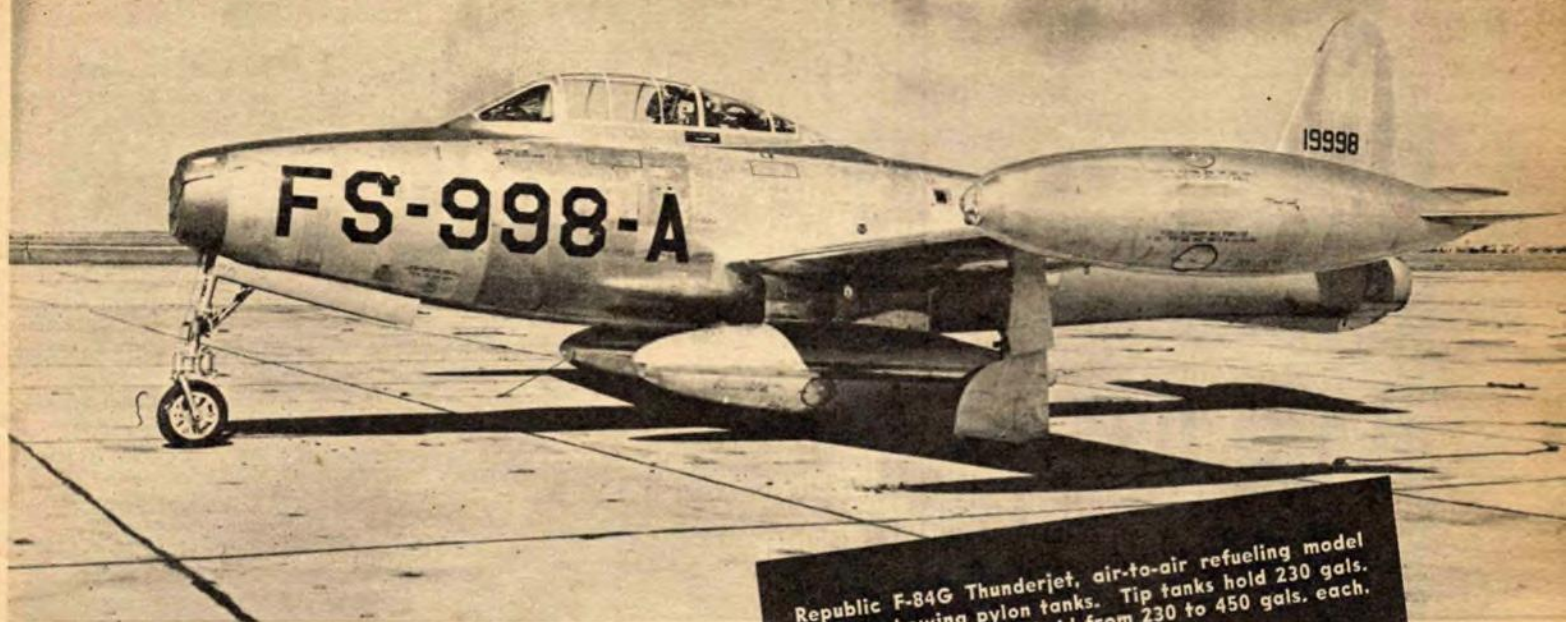
Below: British four-jet bomber, the Short SA-4. Powered by four R. R. Avon engines of 7000 lbs. thrust each. Engines are mounted one above other in each nacelle.



North American F-86E Sabre with probe auxiliary tanks for air-to-air refueling. Contents of these can be pumped into main tanks. Fins on tanks are for stability.





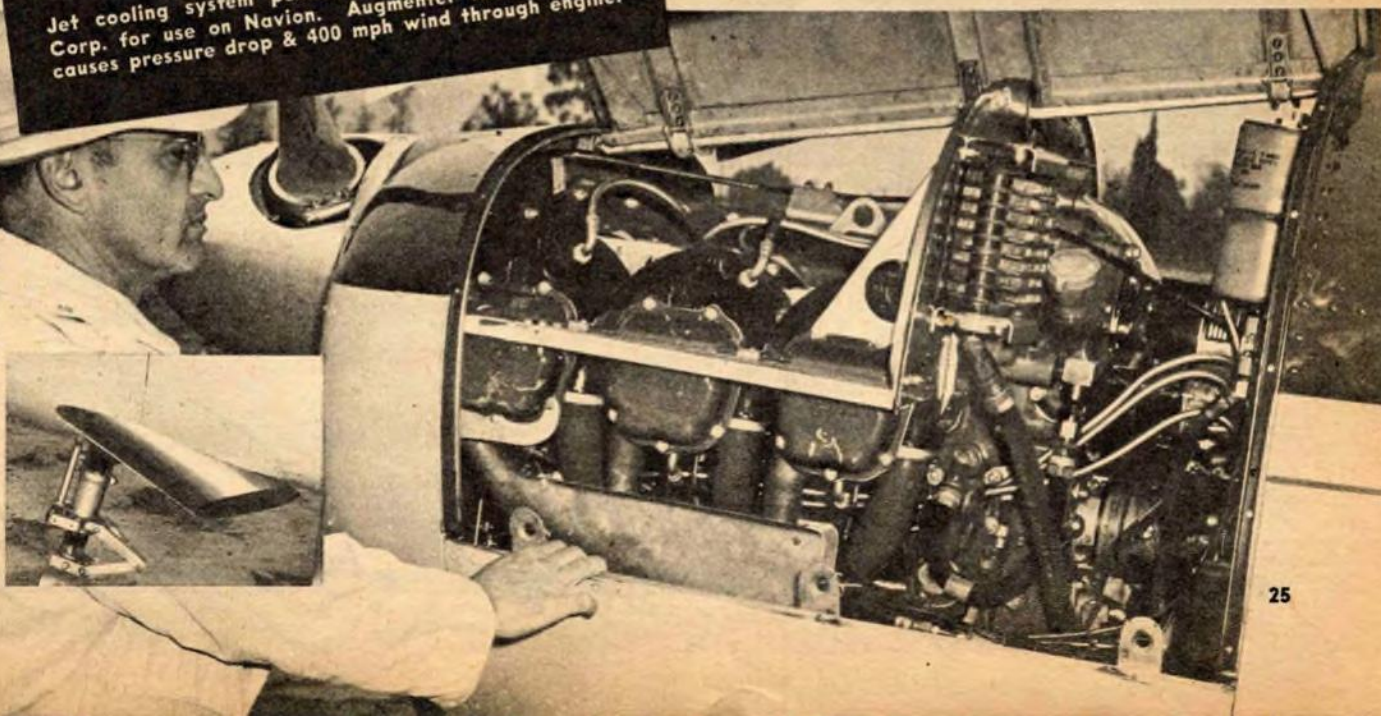


Republic F-84G Thunderjet, air-to-air refueling model of F-84, showing pylon tanks. Tip tanks hold 230 gals. each, pylon tanks can hold from 230 to 450 gals. each.

Below: Piasecki YH-21 Work-Horse, rescue helicopter designed for Arctic work. Can carry 14 troops or 12 litter cases. 1400 hp. Wright R-1820 Cyclone engine.



Jet cooling system perfected by Fletcher Aviation Corp. for use on Navion. Augmenter tube, in inset, causes pressure drop & 400 mph wind through engine.





# Air Trails

SEPTEMBER 1952  
35 CENTS



DOUGLAS XA3D

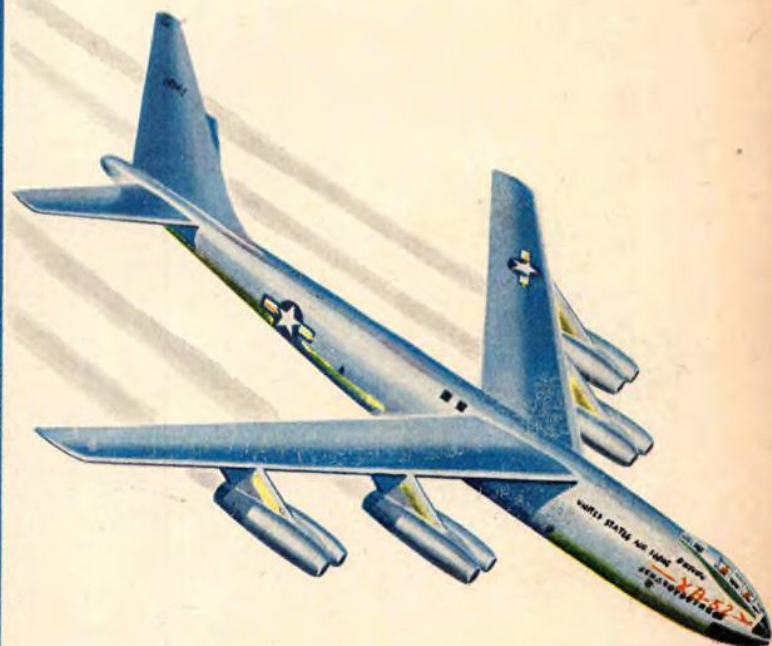
CONVAIR XF-92A



LOCKHEED F-94C

BOEING YB-52

CAL SMITH



Four American Aces



# AIR TRAILS

September  
1952  
Vol. 38, No. 6



Cover: Douglas XA3D, Lockheed F-94C, Convair XF-92A and Boeing YB-52—S. C. Smith

## FOR THE READER

- 8 The CAP Cadet—Col. Kendall K. Hoyt
- 10 R/C Roundup—Howard G. McEntee
- 12 Air Notes
- 14 Airmen of Vision
- 16 Air Adventurers Club
- 19 Soviet "Super Destroyer"  
—William Green
- 20 The World A-Wing
- 24 Air Progress: Ident-Quiz—D. Rolfe
- 26 Crusaders in G-Suits  
—Drawings by Alfred Owles
- 28 America's Top Midget Racer: Shoestring  
—S. Calhoun Smith
- 32 Out of Hot Rod, into Cub!
- 32 Model Matters
- 33 The Prexy Speaks—Frank B. Bushey
- 34 Three-views from behind Iron Curtain  
—Frank Zaic
- 36 Max Holste's MH-152
- 37 The Big City's Big Meet
- 38 Air Model Manual: Precision Aerobatics
- 40 What's the Score on Helicopters?  
—Roy L. Clough
- 44 Little Sport—Robert W. Miller
- 47 Speed Pointers—Harold W. Stevenson
- 48 Comet's Free Flight Pacemaker
- 48 Miniature's Scale Vought Corsair
- 49 Berkeley's R/C Baby Brigadier
- 49 Guillo's B-36 "Solid"
- 50 The Jetex Trio
- 53 Dottie—Joe Bilgri
- 54 Dope Can—Dopester
- 64 Western Roundup—Dick Everett
- 66 Sketchbook
- 68 My Favorite Model—Paul Del Gatto
- 72 Model Plane Club Directory
- 74 Contest Calendar
- 76 Showcase

## THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Editor: Albert L. Lewis. Technical Editor: Alexis Dawydoff. Editorial Production: Carl Happel. Art Director: W. F. Tyler. Editorial Assistants: Rose Borello and Rosalba Accardi. Special Correspondents—Washington: Kendall K. Hoyt; West Coast Modeling: Dick Everett.

### STREET & SMITH PUBLICATIONS, INC.

President.....Gerald H. Smith  
Executive Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 2550 Beverly Blvd., Los Angeles 4, Calif.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright, 1952, by Street & Smith Publications, Inc. 35c per copy. This issue is Vol. XXXVIII, No. 6. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**Photo Correction** . . . That's a very nice picture of the two planes in action from Vancouver, Wash. (July issue). Only there is one slight mistake. The picture was taken by Mr. Rufus Underwood on a 2 1/4 x 3 1/4 Bush Pressman at f 16-1/200. The copy sent in by Harry Ragan was bought from me. Although my husband is not a member of the Glo Bugs he flies with them sometimes.

Mrs. Rufus Underwood, Hillsboro, Ore.

**PB-2a into Half-A** . . . Can the plans for the PB-2a be made for Half-A by doubling them?

Harold E. Leaming, New Orleans, La.

● The Consolidated PB-2a makes a beautiful Half-A job by doubling the plans as they appeared in Air Trails. Either a solid or built-up wing can be used. Use 1/16" sheet (sanded thin) for the built-up wing covering. The fuselage sides can be cut from 1/16" sheet with dead soft blocks for the top and bottom, 1/8" sheet or 1/16" sheet will do for the tail surfaces. 1/16" wire will make a strong landing gear. Engines can range from .039 to .074 cubic inch displacement.

**It's Worth It!** . . . This letter is in comment over the increase in price of Air Trails. I was really in doubt about continuing to buy Air Trails when the price went up, but I sure must say the quality and quantity justify the price. I very seldom write to magazines like this but I realize that this is the only way, other than sales, to know what subscribers want.

K. D. Boyer, Wilmette, Ill.

**Info on "Zofftig" Canard** . . . In the July "From The Reader" you had two pictures of a speed plane. I have information about this plane. It was given to me along with a sister ship which is a Class D by the designer, Frank Calero, who has since given up model building. The ship was called the Pin Tail, it was powered by an Arden .19. It flew very well. The only trouble at first was with the dolly, but it's all right now.

Anthony Veneziano, Newark, N. J.

**The Chinese Across the Valley** . . . I am a subscriber to Air Trails and would like to take this opportunity to thank you for your very fine magazine. It is a welcomed monthly addition to my bunker.

I read with great interest your article "Flight Beyond Gravity." I hope you plan to publish more of such articles. For keeping well informed in the air world, your "Air Notes" is tops.

After seeing Douglas Rolfe's very detailed cutaway drawing of the Mustang P-51B, I thought I might mention the fact that its successor, the F-51, is raising much interest with the Chinese just across the valley from us.

Pfc. Charles H. Brooks, Jr., Korea.

**More on "Poisonous" Dope** . . . I read a letter which stated that the father of a certain modeler claimed that dope is poisonous. Here is what I found out. The big smell in most common dopes is a ketone called acetone with the formula CH<sub>3</sub>COCH<sub>3</sub>, a color-

less liquid which boils at 56.5° Centigrade. It may be made by heating calcium acetate, which is a salt which may be made from acetic acid (vinegar) and lime.

Its worst effects on the human system are to produce intoxication (drunkenness) and sleep. It is less poisonous than ethyl alcohol, which is the alcohol in beer, wine, whiskey, etc. This information was found in the Encyclopædia Britannica.

The other materials in dope are non volatile (i.e., do not evaporate). Hence, one would have to drink the stuff to have any bad effects.

Jerome K. Stephens, Cleveland, Ohio

**One Man's Jet for Hornet** . . . I was very interested in your article "You Can Jet Power Jim's Hornet." I did the same thing last fall, only different. I screwed the Jetex "50" directly onto the bottom of the fuselage, underneath the leading edge of the wing, with the wing in the rearward position. I bent the landing gear forward a little, as the plane had a tendency to nose over on a rough field, weighted the nose, and flew. The plane does fly, but usually in loops. My extreme lack of experience may account for that. I'm mainly a "magazine aviator."

Allen Moore, Ithaca, N. Y.

**More Flying Sites** . . . Saw the "Message To The Aviation Industry" in your July issue and it struck me that support of model aviation by the industry and the military is the best way to increase interest in full size aviation.

Their cooperation and support with contests has been increasing but the real need is very inexpensive. It is merely to help the Sunday flyer to find a place to fly where he doesn't have to worry about baseball, farmer's crops, the noise of his A/2 engine, etc.

It seems to me that there are plenty of large parking areas, ramps, and parade grounds that are big enough for U-control, small free flights, and R/C. If security measures are required, a good model airplane club should certainly know about its members. How about it?

Bob Lange, Belleville, N. J.

### SUBSCRIPTION PRICE

\$3.50 per year in U.S. and Possessions; \$4.50 per year in Canada; \$7.00 per year in countries of the Pan American Union; \$10 elsewhere.

### NOTICE TO SUBSCRIBERS

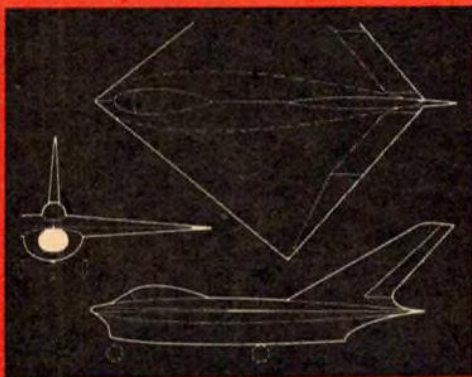
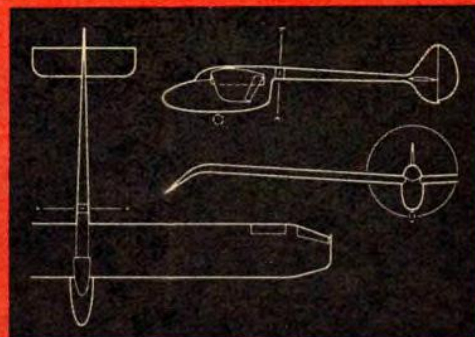
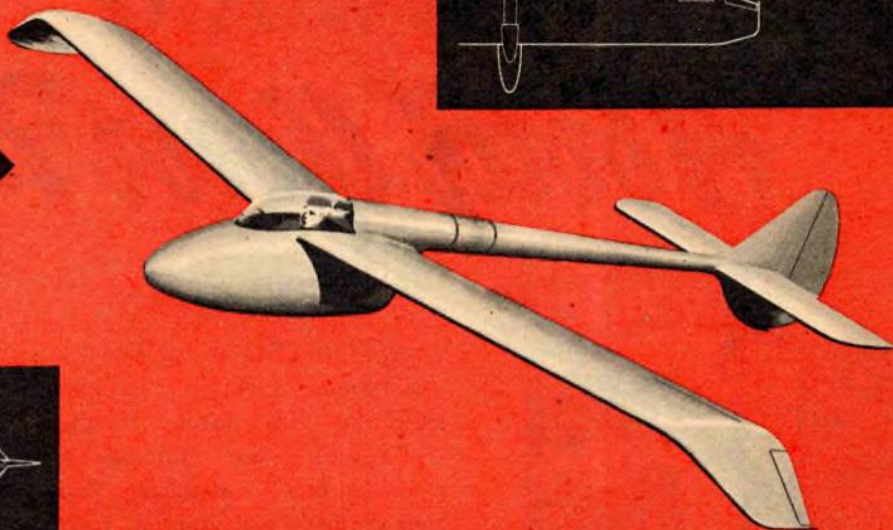
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



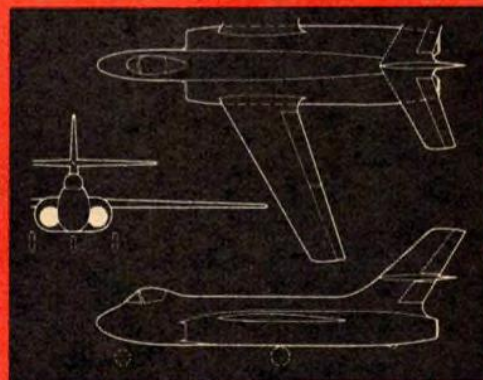
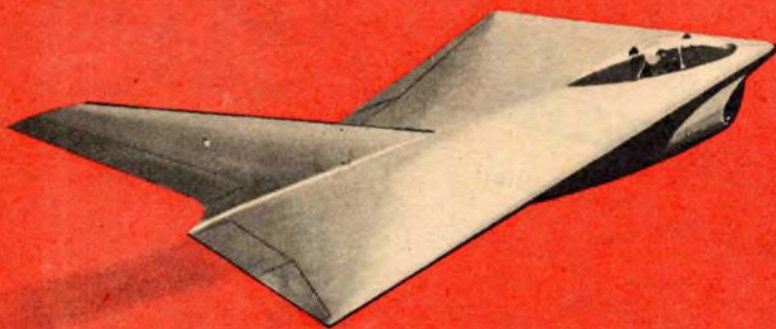
# Airmen of Vision

## DESIGN COMPETITION

Most interesting and unusual design of the month: muscle-powered sailplane by Glen D. Bryant, aeronautical engineer of Starkville, Miss. Foot-operated pedals drive landing wheel for take-off, and propeller. Prop has hollow blades which pump air through sailplane's porous wings for boundary layer control, reducing drag by 50%. Minimum power required for take-off is 0.05 hp. Glide angle is 37.1, sinking speed 1.43 ft/sec.



Diamond planform wing interceptor by Howard Tomashek of Winona, Minn. It is powered by two 8000 lb. thrust axial flow jet engines. Armament consists of eight rocket tubes in the nose firing Mighty Mouse rockets. Fuel tanks and radar equipment are located in the wings. Wingspan is 48 ft., length 66 ft. Maximum speed 100 mph.



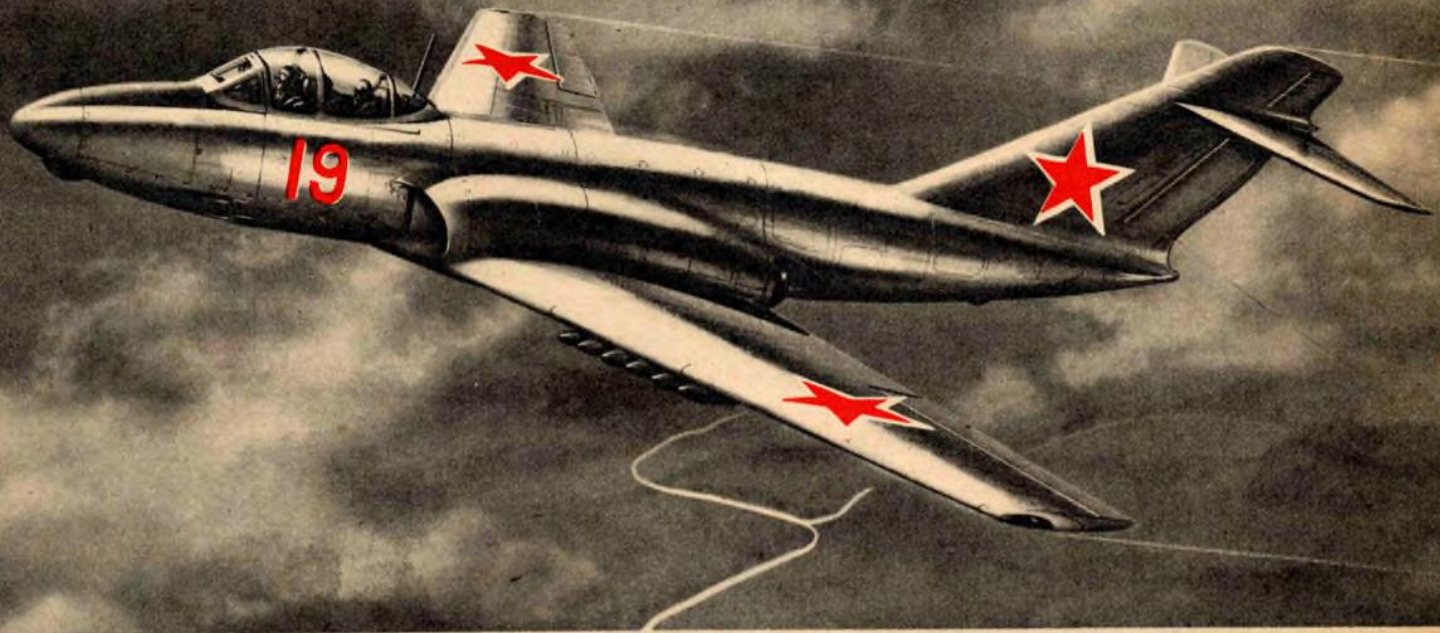
Twin-jet fighter-interceptor by Pfc. Eugene Tomashkin of Tinker AFB, Okla. It is exceptionally heavily armed, mounting six 20-mm and two 75-mm cannon in the nose. The two jet engines develop 7000 lbs. of thrust each. Fuselage, aft of pilot cockpit, holds sufficient fuel to permit the interceptor a range of 2000 miles. Plane is a single-seater, cockpit being equipped with ejection seat. Dive brakes on rear section of fuselage.



Air Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on power plant(s), estimated performance, dimensions, and explanations of any usual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The designs may be of any type, commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.





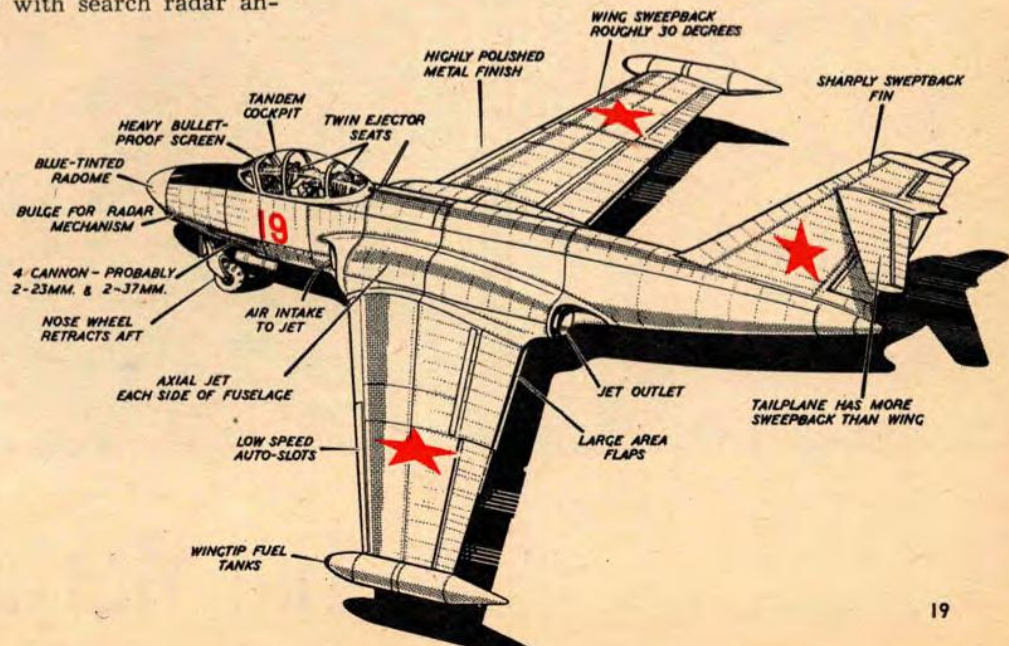
## Soviet "Super Destroyer"

■ Back-slapping, guffawing young Russian pilots stationed at the Gropenhain fighter base in Eastern Germany have been openly talking of a new "super destroyer" which will shortly replace their MiG-15s and sweep Western bomber forces from the skies.

This new, heavily armed, multi-seat "night and bad weather" fighter, fitted with search radar an-

tenna in the nose and comprehensive electronic equipment for round-the-clock interception, has been referred to by the Red pilots as a Mikoyan design, fitting in with reports that the Mikoyan-Gurevich fighter design team split up after producing the MiG-15 way back (Continued on page 57)

**A new menace is in the red skies of Russia, a twin-jet all-weather fighter slated to replace the MiG. Equipped with latest electronic devices and armament, it is a larger and deadlier version of the Korean Communist fighter.**



**By WILLIAM GREEN**

SEPTEMBER, 1952

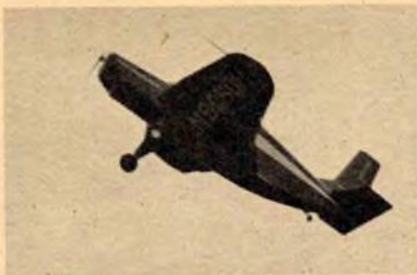




A North American F-86 diving at ground target, blazing away with 5-inch HVAR rockets. The Sabres are equipped with 16 such missiles and can also carry bombs or combinations of rockets and bombs, depending on mission at hand

## The World A-Wing





Lanier Paraplane II. A modified version of the aircraft built over four years ago, vastly improved after 3½ years of testing, eight months of this by Office of Naval Research. Among modifications: longer nose, extended by 2 ft., all-dural tail section, 25% chord flaps. Plane is capable of remaining in air at speed of 19 mph, taking off concrete runway in 100 ft. Can climb at angle as steep as 30 deg. According to designer Lanier, this performance is due to scoop under the wing and Vacu-jets slots on top which provide means for boundary layer control. Will go into production later this year. Contemplated for production also are a 5-place military evacuation job capable of flying at speeds less than 19 mph and roadable.

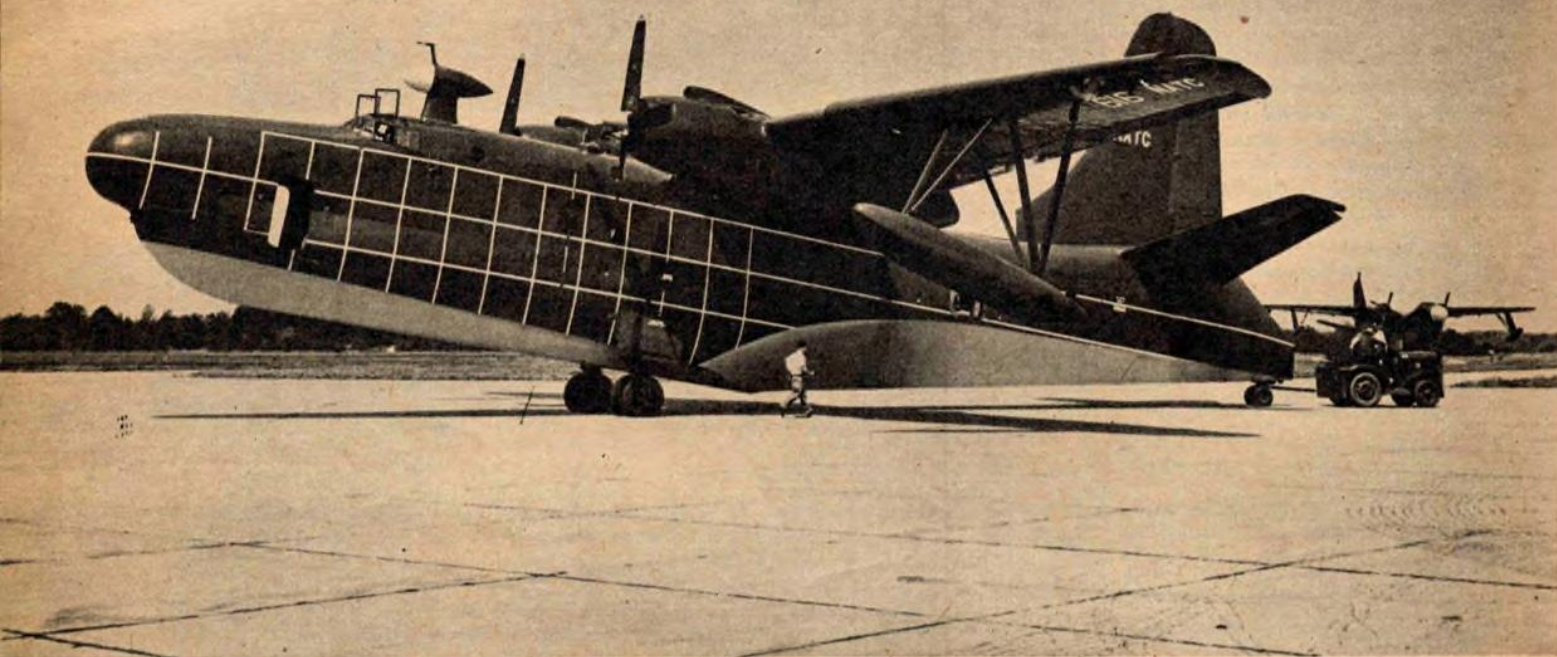


Lockheed "Family Album": Transports built by Lockheed during past 18 years. From bottom to top are: Super Constellation, Constellation; then from left to right: Electra, "14", Ventura and finally the Constitution. Speeds in 18 years rose from 200 to 400 mph.





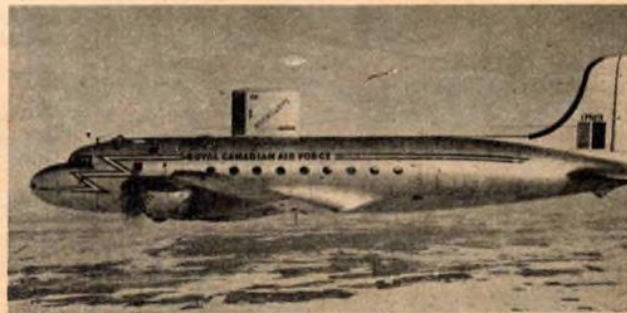
## The World A-Wing



A nosey character. Martin M-270, research flying boat to study most advantageous hull shape. Wings and engines are from a PBM.



S.E.2010 Armagnac, French super airliner now in service between France and No. Africa. Can carry 107 passengers. Span 160.5 ft.



Rockcliffe Ice Wagon. An RCAF Canadair specially fitted for research in icing problems. Fin on fuselage for wing de-icing experiments.

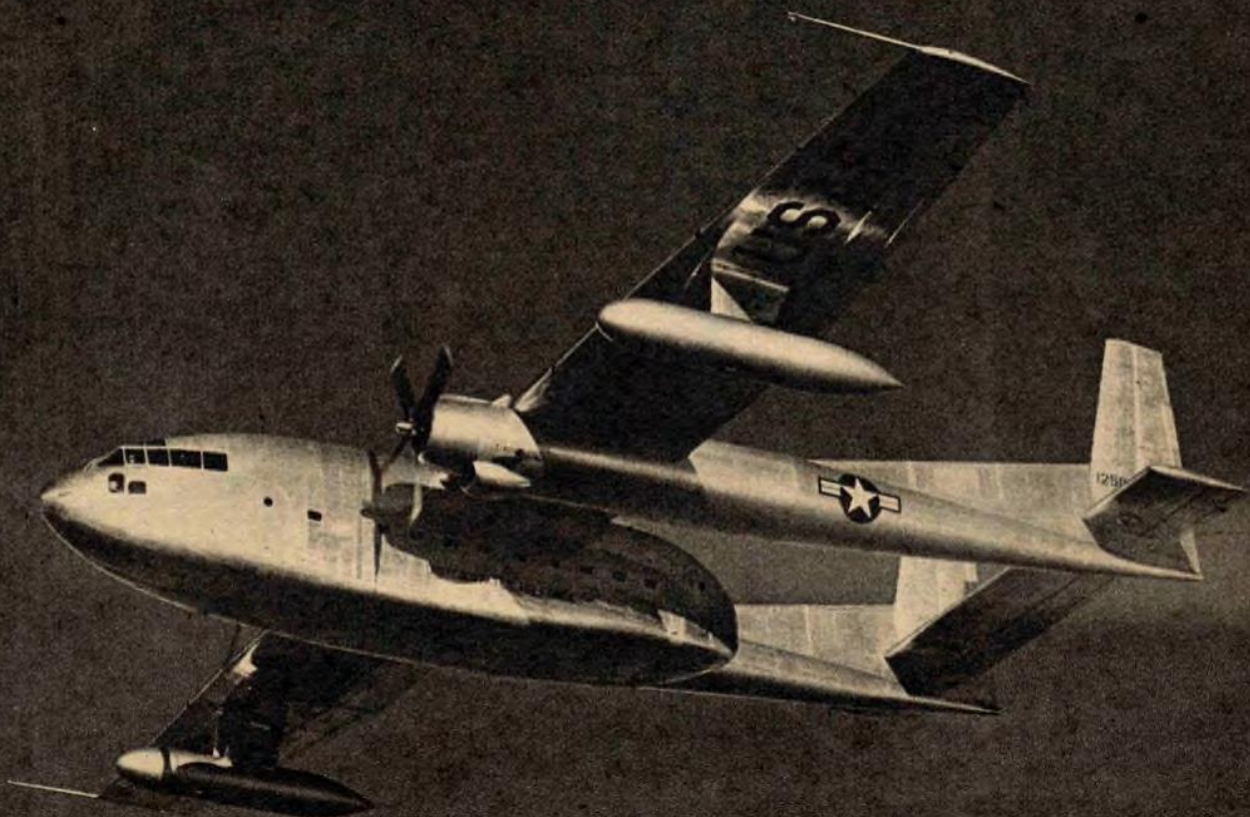


SO-30 Nene powered Bretagne, French airliner. Presently serves as experimental aircraft for testing feasibility of jet transports in France.



Bearing a close resemblance to the Taylorcraft, this Argentine light plane, the El Boyero, is on order for flying schools and aero-clubs.





Above: Fairchild C-119H, newest member of the Flying Boxcar family. Wingspan has been extended to 148 ft. All fuel is carried in external wing tanks. Cargo capacity has also been greatly increased; can carry 27,200 lbs. Center right: the graceful sailplane is a Moswey IV from Switzerland, in which Swiss champion Rene Comte soared to 29,000 ft. in South Africa. Span is 47 ft. Glide angle 30 to 1, sinking speed 2 ft. per sec. Below left: Doman YH-31 military helicopter for which an order has been placed by the military with the Doman Helicopters, Inc. Capacity is for six, can be converted as ambulance. Below right: Piper L-21 military liaison plane. Basically the Super-Cub, powered by a 125 hp Lycoming engine. Landing gear permits operation from very rough-'n'-ready fields.





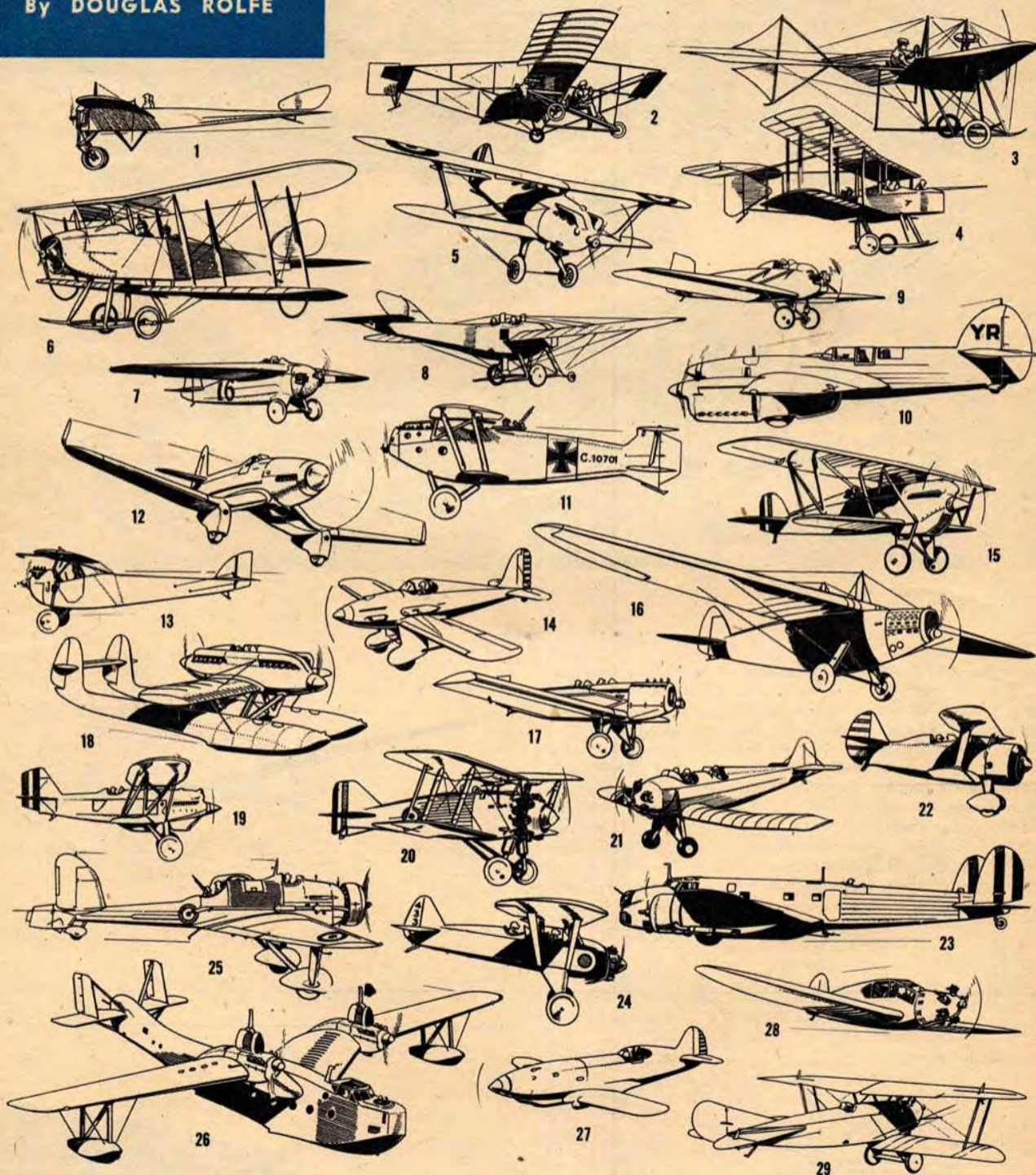
# AIR PROGRESS

By DOUGLAS ROLFE

## IDENTO-QUIZ

Are you a plane spotter from way back? Here's a test for experts.

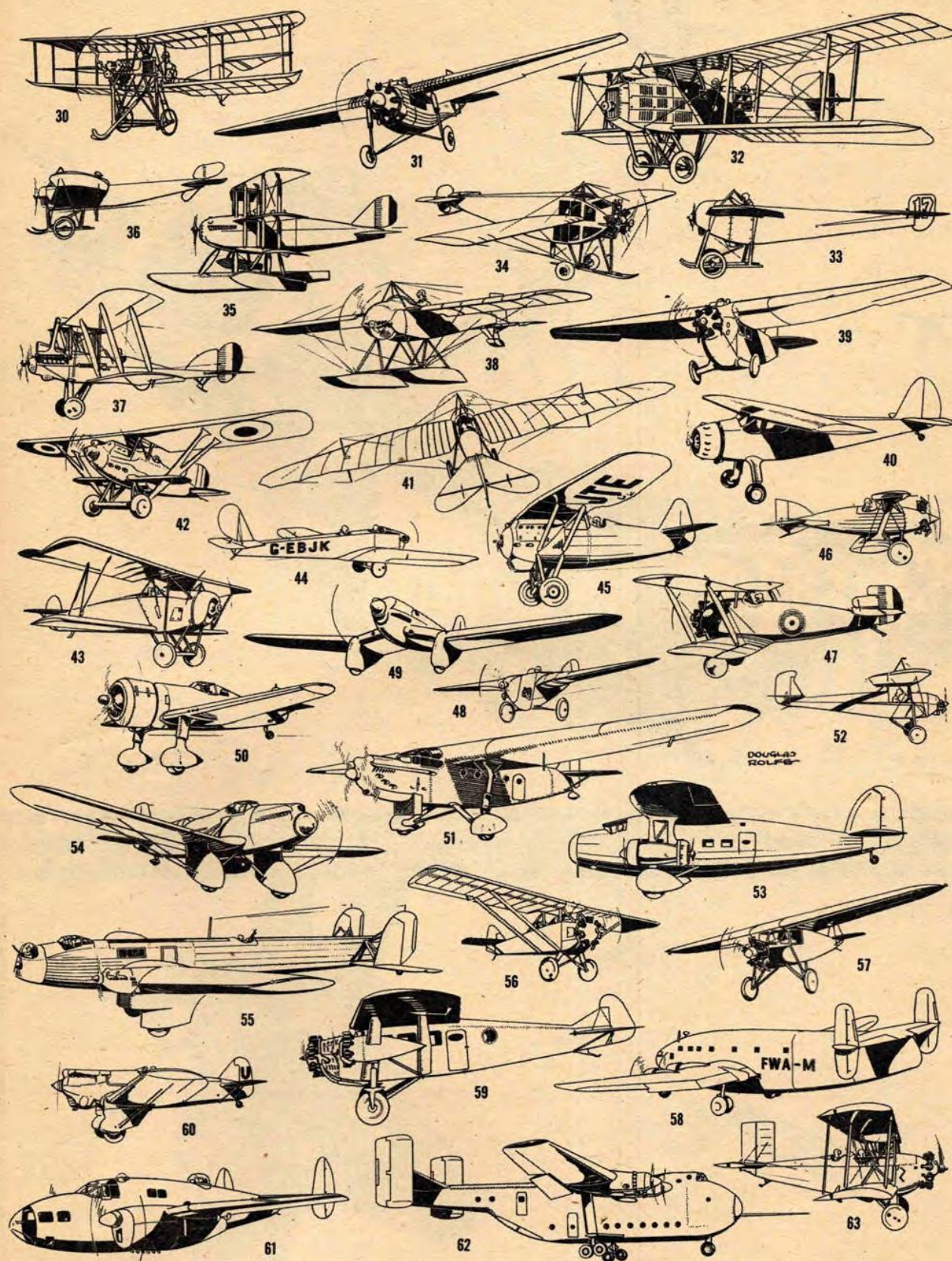
Write out answers, then check below. Score of 60 or more: excellent; 50 or more: good; 40 or more: not bad; under 40: well . . .



1. Blériot, 1911, Fr.; fish-tailed Blériot, side-by-side seats. 2. Walden, 1910, U. S. A.; first successful U. S. monoplane. 3. Fokker, 1910, Hol.; first successful Fokker. 4. Vickers F.B. 5, 1913, G. B.; prototype model Vickers "Gun Bus." 5. Breguet XIX, 1924, Fr.; 400 hp Lorraine-Dietrich. 6. B.E. 3, 1913, G. B.; The "Bloater," a bad B.E. design. 7. Heath Tomboy, 1924, U. S. A.; winner Aero Digest Cup. 8. Bristol Military, 1912, G. B. 9. Avia BH. 16, 1924, Czechoslovakia. 10. Bellanca, 1937, U. S. A.; specially built for N. Y.-Paris flight. 11. Hannoveraner, 1918, Ger.; 2-seat fighter, 180 hp Argus. 12. Blohm & Voss Ha 137, 1937, Ger.; dive bomber, 680 hp Junkers Jumo. 13. Driggs Dart, 1923, U. S. A.; Converted Henderson motorcycle engine. 14. Curtiss, 1932, U. S. A.; first low-wing Curtiss pursuit type. 15. Boeing PW-9c, 1926, U. S. A.; 430 hp Curtiss D-12. 16. Blériot 110, 1930, Fr.; 600 hp Hispano-

Suiza, long range. 17. Farman Sport, 1930, Fr.; 90 hp Renault. 18. Dornier, 1927, Ger.; Schneider Cup entrant, two 1,000 hp. 19. Curtiss Hawk, 1926, U. S. A.; first Air Corps fighter designated P-20. Gloster Grebe, 1925, G. B.; standard R.A.F. pursuit. 21. Barling NB4-L, 1929, U. S. A.; 90 hp Lambert radial, 3-place. 22. Chato, 1937, Russia; used in Spanish civil war by Loyalists. 23. Fiat B.R. 20, 1937, It.; 2 Fiat 1,000 hp A-80s. 24. Doyle Oriole, 1929, U. S. A.; 65 hp LeBlond radial. 25. Handley-Page, 1935, G. B.; all-metal 680 Bristol Pegasus. 26. Short R. 24131, 1935, G. B. 27. Curtiss P-37, 1939, U. S. A.; immediate predecessor of P-40 series. 28. Eaglerock Bullet, 1929, U. S. A.; early approach to 4-place pers. plane. 29. D.F.W., 1913, Ger.; world's long-distance record breaker. 30. Dufaux, 1910, Switzerland; first successful Swiss airplane. 31. Hamilton, 1928, U. S. A.; McDonnell design

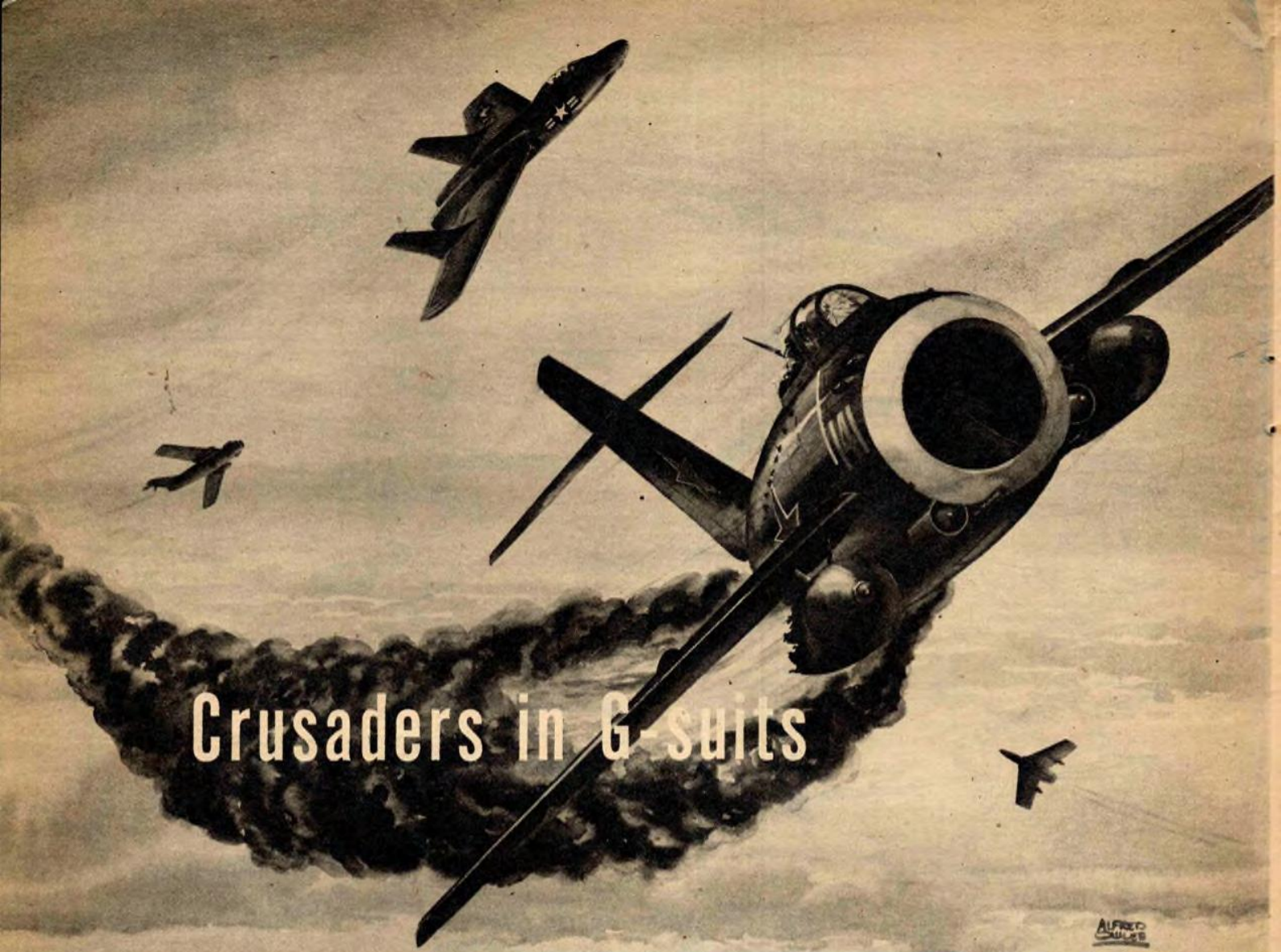




(pre-Akerman). 32. Breguet 14B, 1918, Fr.; notable for flaps on lower wings. 33. Nieuport-Sabelli, 1911-12, Fr.-It.; modified version of reg. design. 34. Avro, 1912, G. B.; experimental cabin mid-wing. 35. Curtiss 18T, 1923, U. S. A.; winner Curtiss Marine Trophy. 36. Bristol-Prior, 1911, Fr.-G. B.; 1st Bristol monoplane. 37. R. A. F. BE-12, 1917, G. B.; single-seat version of B.E. powered with 140 hp V-12. 38. Borel, 1913, Fr.; first torpedo plane. 39. Focke-Wulf, 1924, Ger. 40. Cassna, 1935, U. S. A.; prototype model C-145. 41. Handley-Page, 1913, G. B. 42. Nieuport-Delage, 1932, Fr. 43. Fokker S. 11, 1921, Hol.; side-by-side 2-seat trainer. 44. Bristol Brownie, 1922, G. B.; 20 hp Bristol Cherub. 45. Dewoitine, 1930, Fr. 46. Lincoln Sport, 1922-23 U. S. A.; 35 hp Anzani radial. 47. Sopwith 8F-1 (Snail), 1919, G. B.; 180 hp A.B.C. Wasp radial, all-wood monocoque fuselage. 48. R.A.E. Hurricane, 1923, G. B.;

ultra-light cantilever monoplane. 49. Supermarine S.7130, 1936, G. B.; note resemblance to Blohm & Voss (12). 50. Fokker D-21, 1937, Hol. 51. Ford Express-Mailplane, 1930, U. S. A.; 650 hp Hispano-Suiza. 52. Long Longster, 1932, U. S. A.; variously powered. 53. Dornier Do.K, 1932, Ger.; 4 240 hp Walter radials. 54. Curtiss A-8, 1932, U. S. A. 55. Fairey Hendon, 1935, G. B.; long-range heavy bomber. 56. Fiat A.S.T., 1929, It.; 85 hp Fiat A-50 radial. 57. Kari Keen Coupe, 1930, U. S. A. 58. Breguet Br. 761, 1948-49, Fr.; fast, heavy freightplane. 59. Bach Air Yacht, 1930, U. S. A. 60. Kawasaki C.5, 1934, Japan; 800 hp Kawasaki VIII. 61. Fairchild XAT-14, 1942, U. S. A.; Duralum construction. 62. Bristol Freighter, 1951, G. B.; 4-wheel truck landing legs. 63. Curtiss Lark, 1926, U. S. A.; square lines resemble Farman. ("R.A.F." here stands for "Royal Aircraft Factory.")





# Crusaders in G-suits

If and when Vought Cutlass is pitted against Red jet fighters, this may, very well, be plight of vaunted Russian MiG-15s. Two Grumman Panthers off carrier tackle Commie Il-16 four-jet bomber, firing its fuel tanks with shots from 20-mm guns.







An ace in the making: USAF F-86 Sabre pilot flames MiG-15 above Korean cloud cover. These paintings all by Alfred Owles. F-86s against MiG-15s. Though Chinese have superiority in numbers, we excel them in pilot skill and technical know-how.





# AMERICA'S TOP MIDGET RACER: **Shoestring**

Right from the design drawings, this U-control flying scale's accuracy is something to rave about. Let's go, men!

By S. CALHOUN SMITH

■ Since the inauguration of the Midget racing class in 1947 under Goodyear sponsorship, the basement-built pylon polishers have shown remarkable progress in design and performance. Race speeds have jumped from 165 mph (1947) to 200 mph, and the airplanes themselves have demonstrated the high degree of craftsmanship and ingenuity of the individual builders in gaining so much performance from the 85 hp Continental engine.

Now sponsored by Continental Motors, the midget races held in Detroit in September 1951 saw *Shoestring* a second-time winner of the big prize.

Pilot John Paul Jones, from Van Nuys, Calif., turned in the highest qualifying speed of 197.2 mph, and flew the race to win at an average speed of 199.778 mph. Which meant that some of the laps flown were well over

ALL TAIL SURFACES 3/8" SHEET

VECO ELEVATOR HORN  
1/16" DIA. WIRE PUSHROD

SILK COVERING

1/16" DIA. WIRE SKID

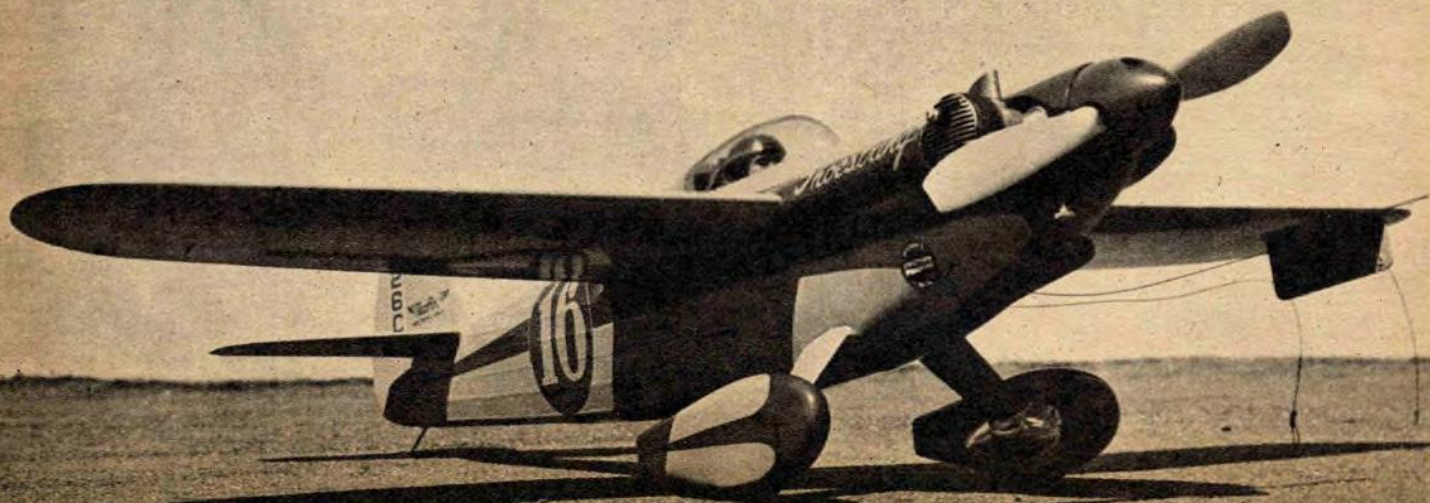
WING CONSTRUCTION :  
1/16" SHEET SKINS  
1/8" SHEET RIBS  
1/4" SQ. L. E.  
1/8" X 1/2" SPAR  
1/2" SHEET TIPS

AERO-GLOSS FINISH

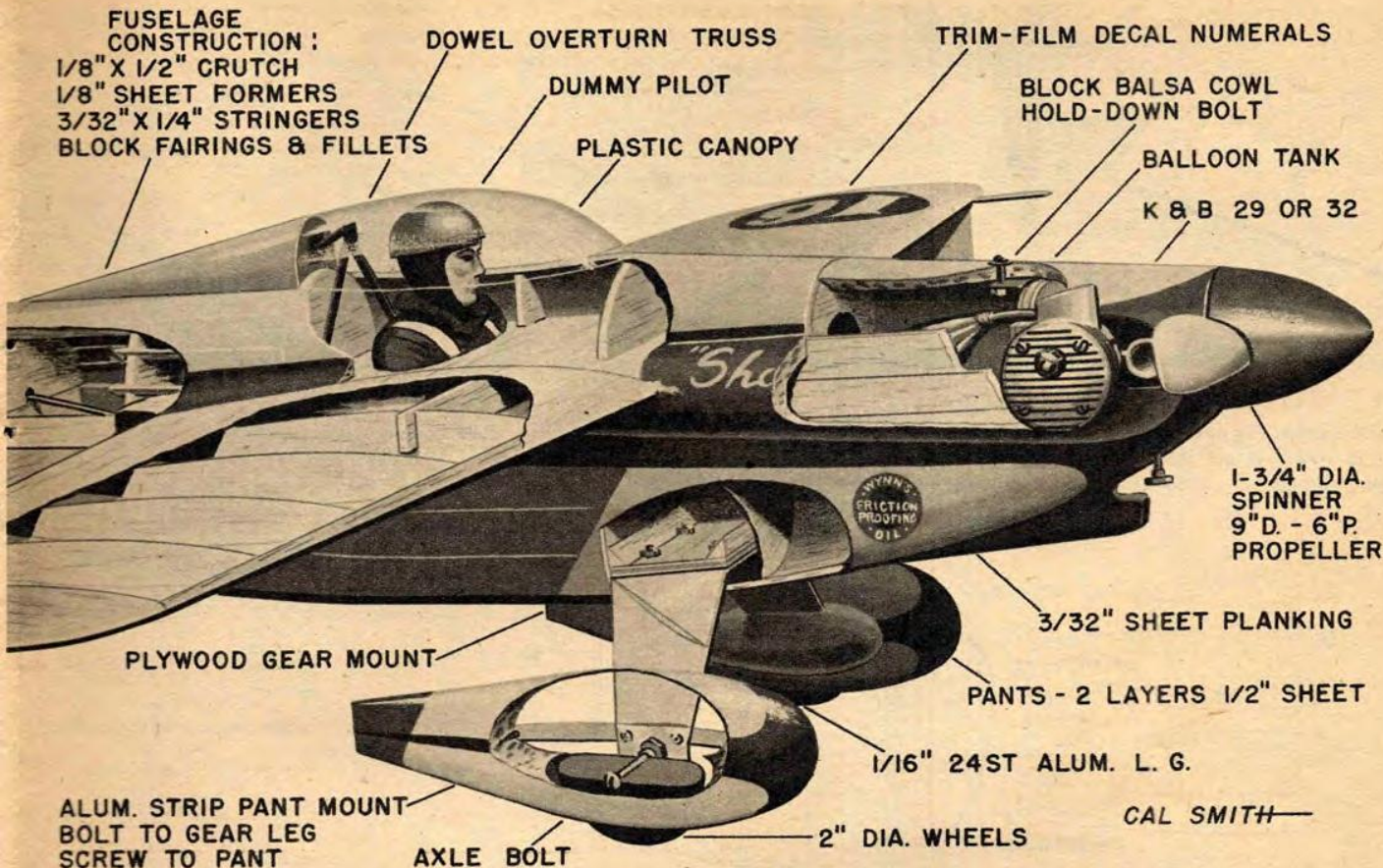
200 mph. Equal credit must be given to both pilot and airplane designer. Jones flew the course like clockwork, emphasizing the value of precision flying as a race-winning factor. Rodney Kreimendahl, designer of *Shoestring*, turned out a beautiful design with much attention given to the other race-winning factor—cleanness.

The ship is a high mid-wing with engine fairing following through into the wing fillet—the most desirable arrangement. All flying surfaces are filleted well into the fuselage. The flat-plate Cessna-type landing gear has a generous fairing, and the wheel pants are relatively large, making for good streamlining of the chubby wheels. The bottom of the oil tank is shaped to lie flush with the lower cowling line, and external fins are welded directly to the tank to aid in oil cooling.

If it wasn't for that K&B engine and control line guide, you'd swear this is the full-scale *Shoestring*. Ain't she a mighty purty job?







A reworked Macauley metal racing prop is used and engine exhaust stacks are pointed rearward for the small advantage gained by jet action of exhaust gases. The overall impression of the airplane can only be described as "solid." Proportions, moment arms, and aspect ratios are all sensible, straightforward and honest. Span is 19 ft., length is 17 ft. 9 in.

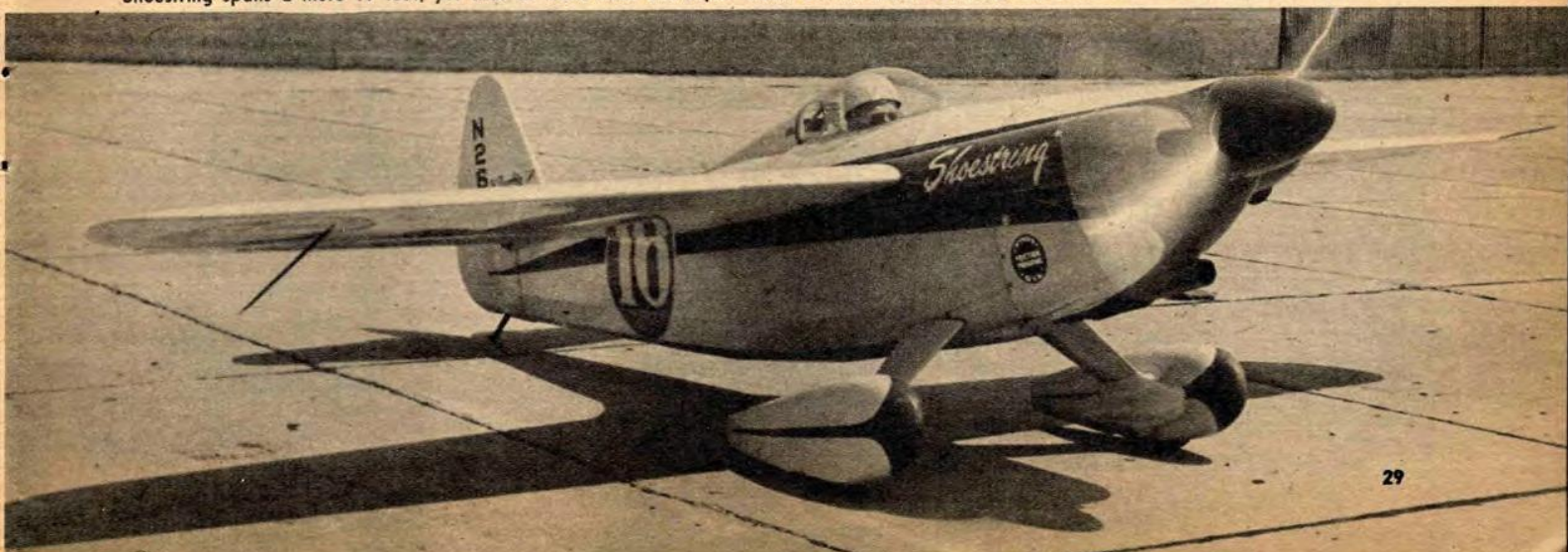
The little speedster has welded steel tube fuselage, stringered and fabric covered, with all-wood plywood covered wing and tail surfaces. Engine fairings, cowl, struts and pants are aluminum. The most outstanding feature of the airplane is the finish. The color scheme is a bright chartreuse and fire-engine red, rubbed down and waxed to the highest gloss seen at the races. You can barely stand to look at the ship in the sunlight!

Modeling *Shoestring* is a natural for flying scale. The plans presented are scaled directly from accurate three-view drawings supplied by the designer. The odd scale of  $1\frac{3}{4}" = 1'$  was chosen so the ship would have a reasonable size and wing loading. Every effort was made to keep the construction light so good flight performance would result.

Span of the model is 33" and length 31". Wing area is 200 sq. in. and weight 28 oz., giving a wing loading of 14 oz./100 sq. in. With the K&B .32 engine the ship really moves and the symmetrical airfoil permits some stunt-ing, although the ship is not light enough to compete as a pure stunt model. The symmetrical wing is the main departure from scale on the model.

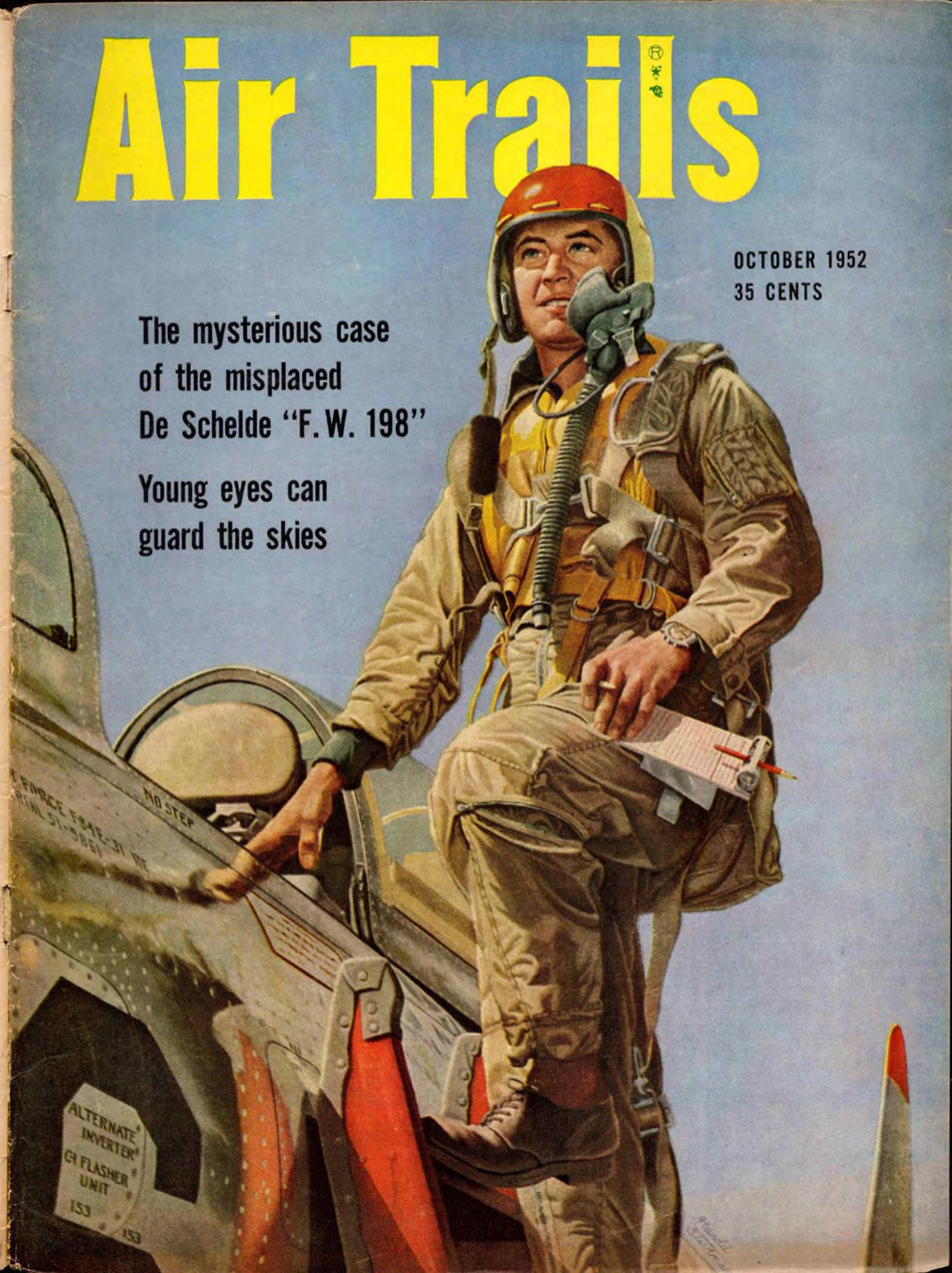
Construction details on full-size plans available.

*Shoestring* spans a mere 19 feet, yet flies at more than 200 mph! Sleek Continental racer took top honors at two National Air Races.





# Air Trails



OCTOBER 1952  
35 CENTS

The mysterious case  
of the misplaced  
De Schelde "F.W. 198"

Young eyes can  
guard the skies

ALTERNATE  
INVERTER  
GI FLASHER  
UNIT

153

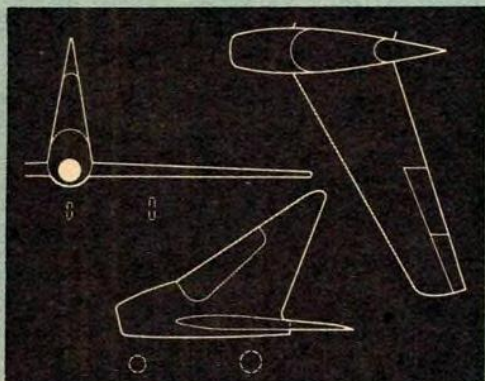
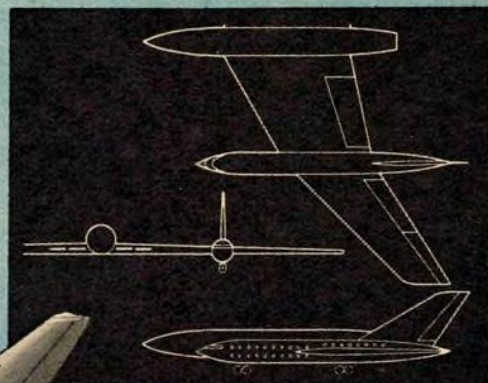
153



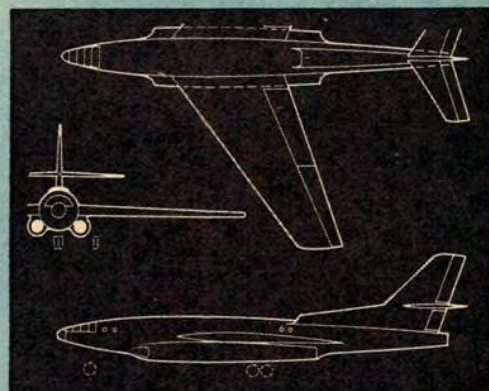
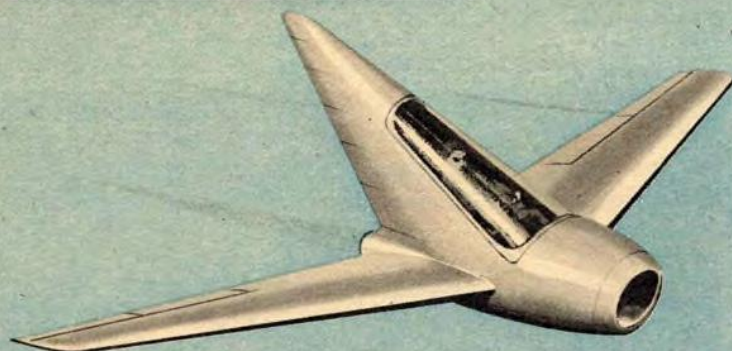
# Airmen of Vision

## DESIGN COMPETITION

Atom-powered commercial aircraft is top entry; by Ray Ogden, Norman, Okla. Designed to minimize shielding problems, the atomic reactor-powered turbines are located in center structure. Passengers and cargo ride in outer fuselages. Estimated thrust of engines is 75,000 pounds through the turbine "chain." Center wing is swept 30 degrees; outer wings are at an angle of 45 degrees.



Making it a "multi-country" month, J. Temple of Toronto, Ont., comes up with this interesting 3-jet bomber. Two of the 6000 lb. thrust turbojet engines are located at mid-fuselage, third is in the tail. Span is 104 feet, length is 98 feet. Speed is 600 mph; range is 3,000 miles or better. Main wheels retract up and back at 30 deg.



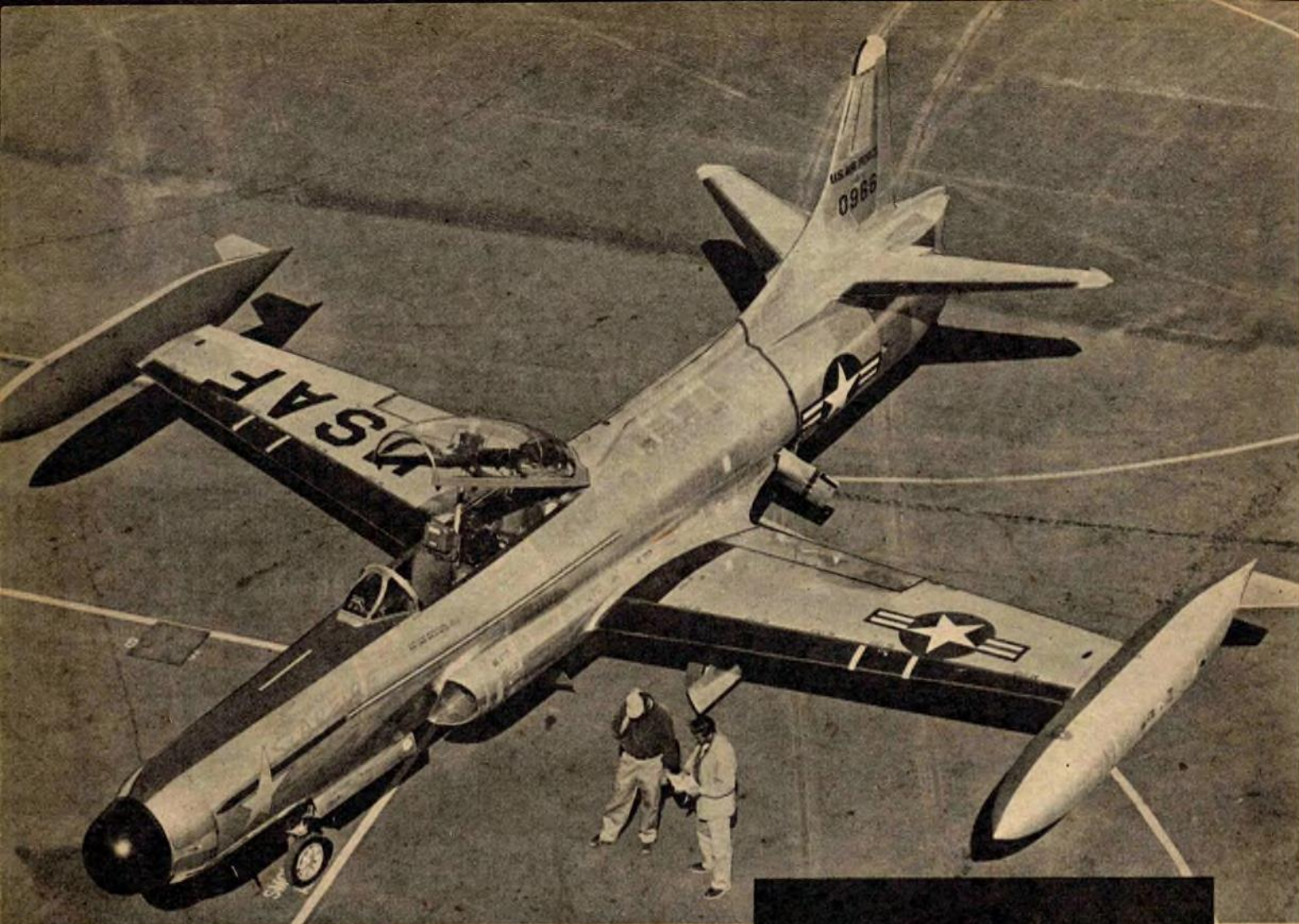
The small Turbomeca jet powerplants appeal to Gunnar Zackrisson of Vanersborg, Sweden, as is evident by this tiny single-seat sportplane. Soaring qualities of this craft should be quite excellent. Pilot straddles air intake. Span is 550 cm.; length, 245 cm.; overall length, 225 cm.



Air-Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The design may be of any type: commercial aircraft, military planes (fighters bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



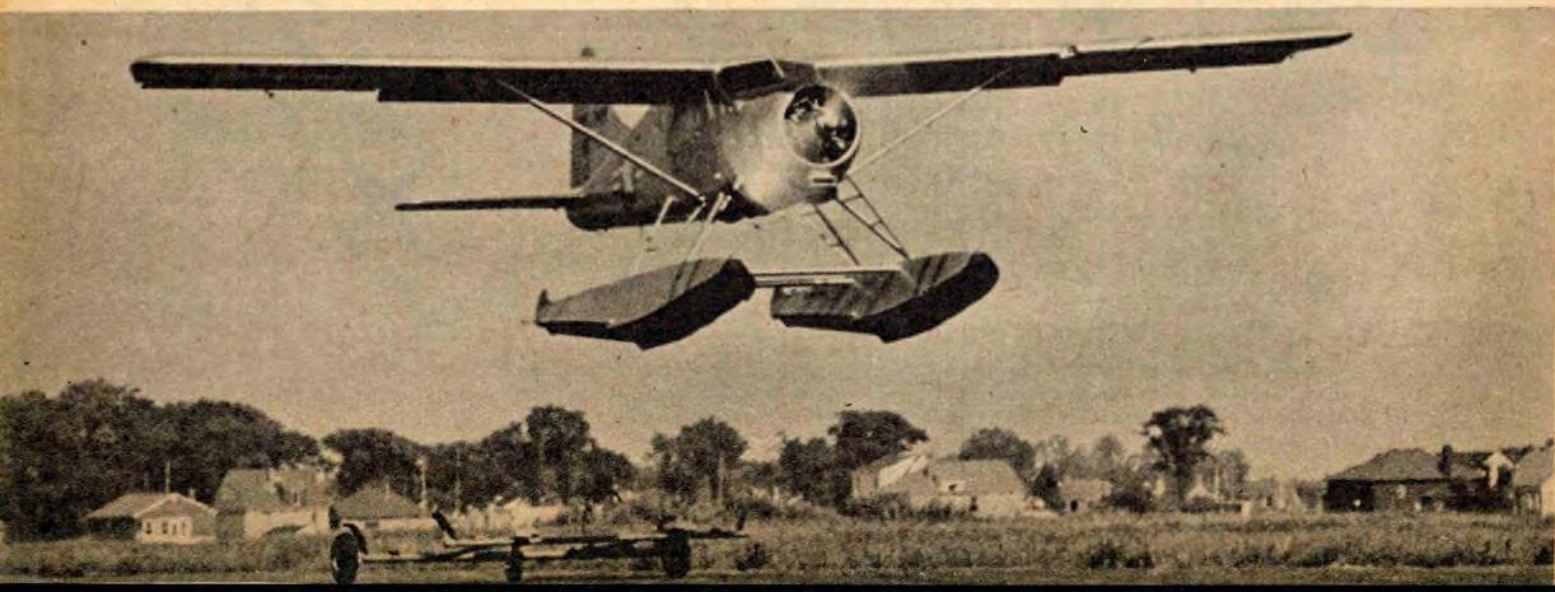


American airpower's latest answer to air invasion: Lockheed F-94C Starfire, all-weather jet interceptor. Radar and "brain-like" instruments enable it to spot enemy, lock onto target, track, aim and open fire, with its 24 2.75 inch rockets housed in ring of firing tubes around nose. (See inset.) Main duty of pilot is to guide it on take-off, approach, landing. Inset photo by INP.

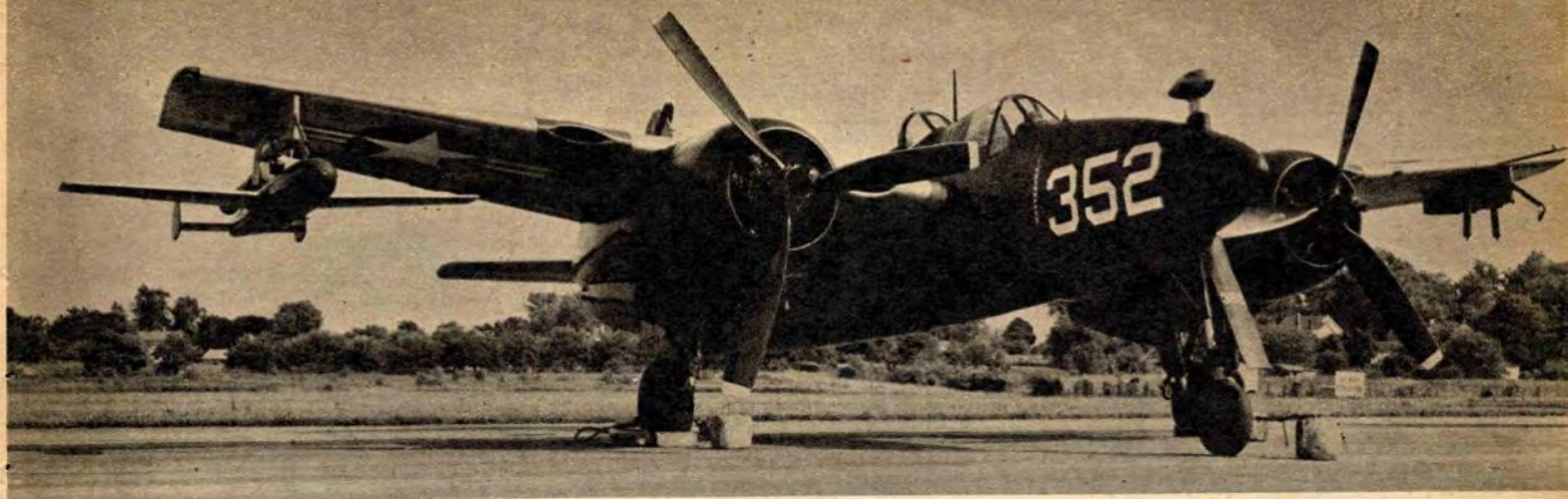


## The World A-Wing

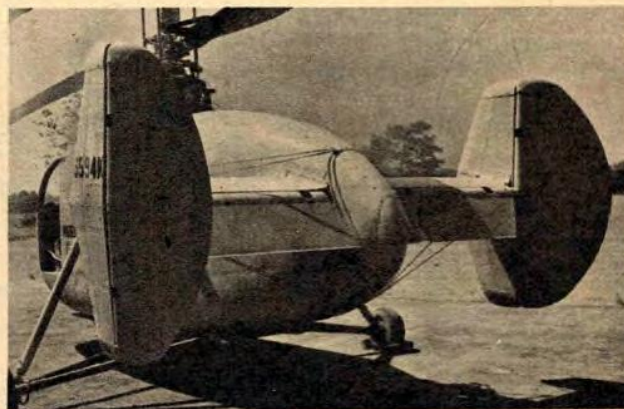
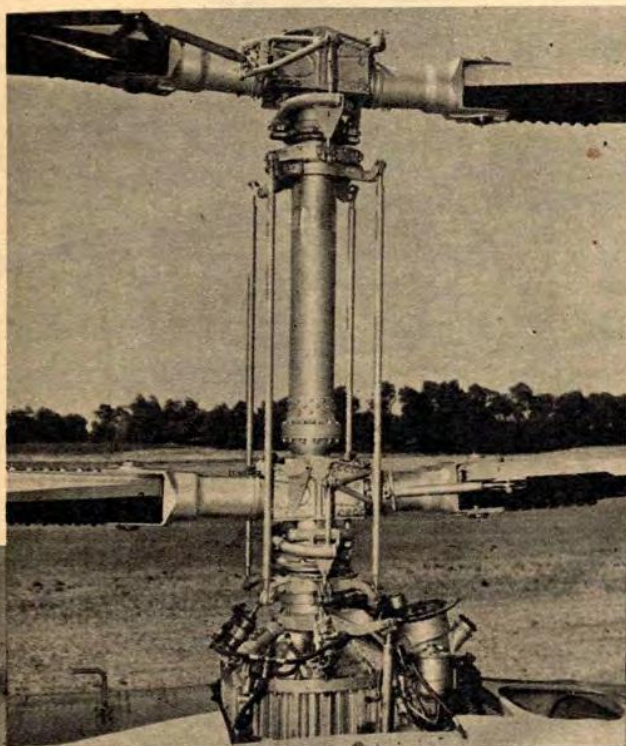
de Havilland Beaver, USAF L-20A, floatplane leaving ground via special dolly. With 14 mph headwind, became airborne in 375 ft.







Grumman F7F-2D Tigercat with a KD2G-2 Katydid jet target drone slung under starboard wing. The Tigercat is a special test plane used at the Johnsville, Pa., NAS for hauling aloft jet drones, guided missiles, to obtain data. Note second cockpit for observer-radio operator.



Gyrodyne Model 2C, seven-place co-axial helicopter being tested for the Navy. Co-axial blade arrangement, left, eliminates torque requires no tail rotor. Normal rudder for turns, above. 450 hp P&W.



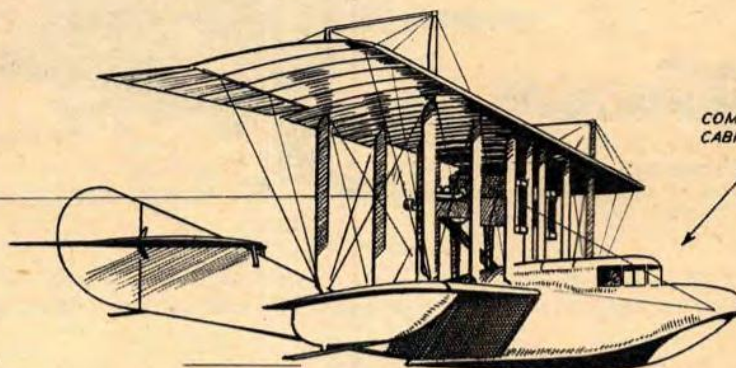


# AIR PROGRESS

By DOUGLAS ROLFE

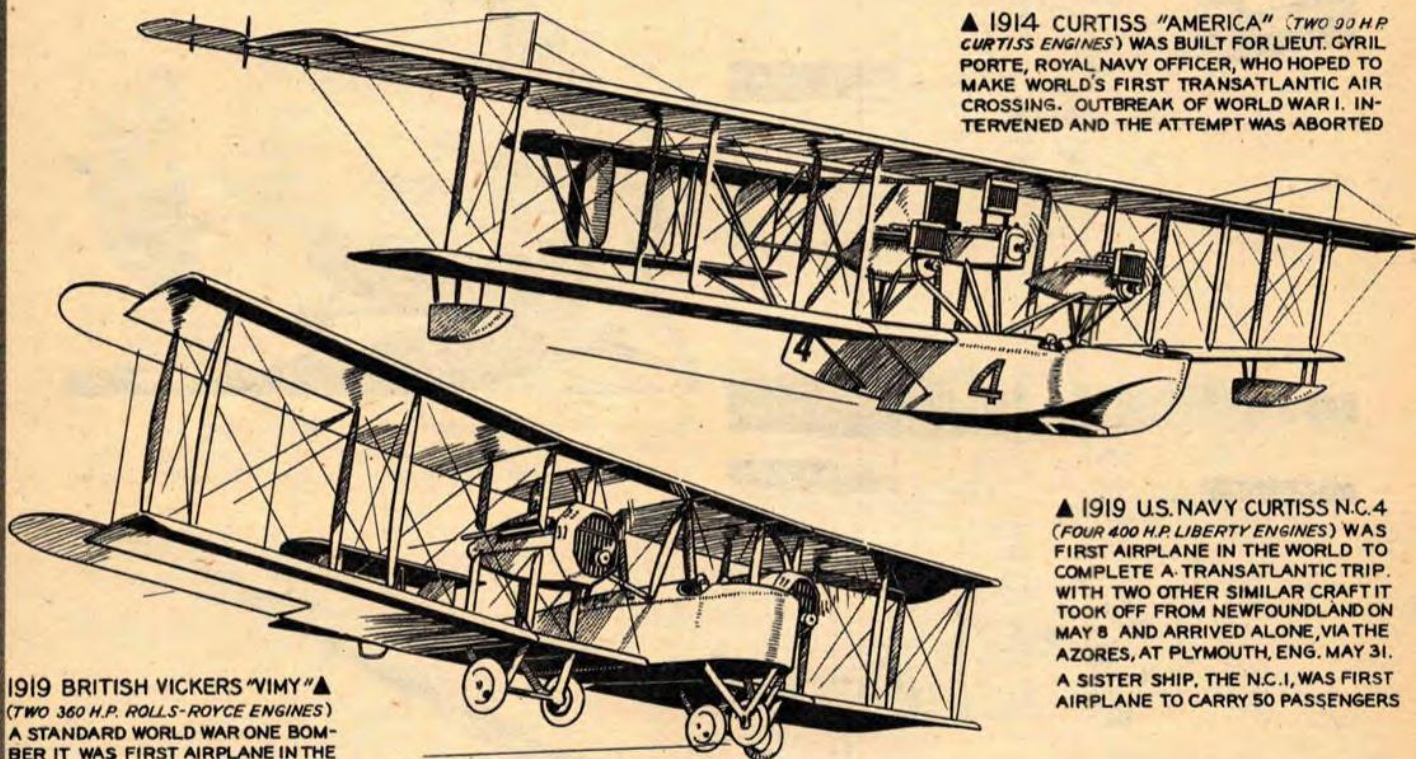
## Conquest of the Atlantic

NOTE: CURTISS BOATS WERE BEST  
▼ IN THE WORLD AT THIS TIME ►



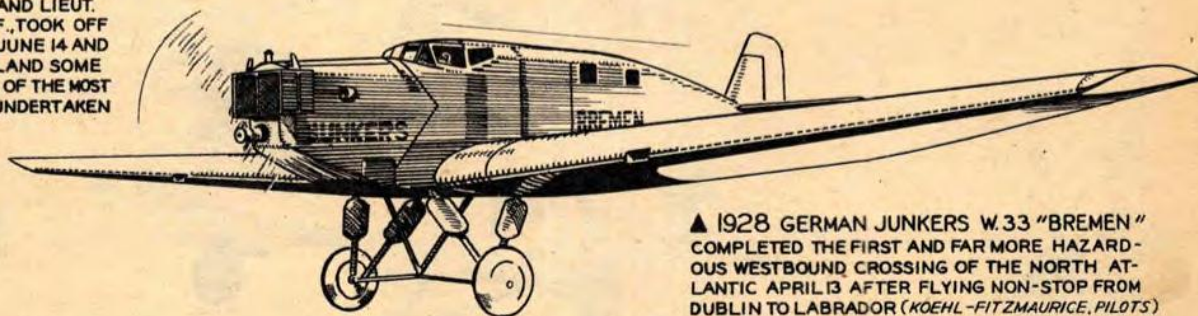
COMPLETELY ENCLOSED  
CABIN IS NOTEWORTHY

▲ 1914 CURTISS "AMERICA" (TWO 90 H.P. CURTISS ENGINES) WAS BUILT FOR LIEUT. GYRIL PORTE, ROYAL NAVY OFFICER, WHO HOPED TO MAKE WORLD'S FIRST TRANSATLANTIC AIR CROSSING. OUTBREAK OF WORLD WAR I. INTERVENED AND THE ATTEMPT WAS ABORTED



▲ 1919 U.S. NAVY CURTISS N.C.4 (FOUR 400 H.P. LIBERTY ENGINES) WAS FIRST AIRPLANE IN THE WORLD TO COMPLETE A TRANSATLANTIC TRIP. WITH TWO OTHER SIMILAR CRAFT IT TOOK OFF FROM NEWFOUNDLAND ON MAY 8 AND ARRIVED ALONE, VIA THE AZORES, AT PLYMOUTH, ENG. MAY 31. A SISTER SHIP, THE N.C.1, WAS FIRST AIRPLANE TO CARRY 50 PASSENGERS

1919 BRITISH VICKERS "VIMY" ▲  
(TWO 360 H.P. ROLLS-ROYCE ENGINES)  
A STANDARD WORLD WAR ONE BOMBER IT WAS FIRST AIRPLANE IN THE WORLD TO MAKE A NON-STOP CROSSING OF THE NORTH ATLANTIC. THE PILOTS, CAPT. ALCOCK AND LIEUT. WHITTEN-BROWN R.A.F., TOOK OFF FROM NEWFOUNDLAND JUNE 14 AND CRASH-LANDED IN IRELAND SOME 16 HOURS LATER - ONE OF THE MOST DARING FLIGHTS EVER UNDERTAKEN

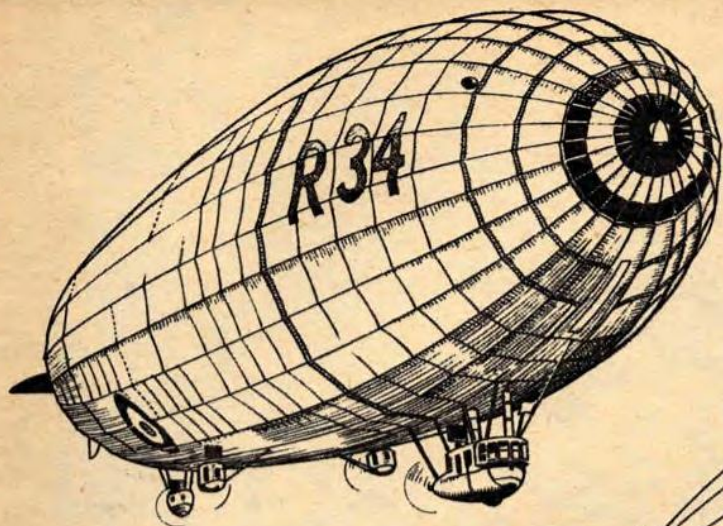


▲ 1928 GERMAN JUNKERS W.33 "BREMEN" COMPLETED THE FIRST AND FAR MORE HAZARDOUS WESTBOUND CROSSING OF THE NORTH ATLANTIC APRIL 13 AFTER FLYING NON-STOP FROM DUBLIN TO LABRADOR (KOEHL-FITZMAURICE, PILOTS)

In telling the pictorial history of the conquest of the Atlantic we have omitted the Lindbergh saga since this has already been thoroughly documented and our concern here is with the other machines and the other men who blazed the trail over both North and South Atlantic Oceans and who are also to be regarded as real pioneers.

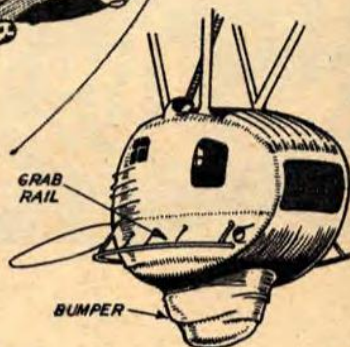
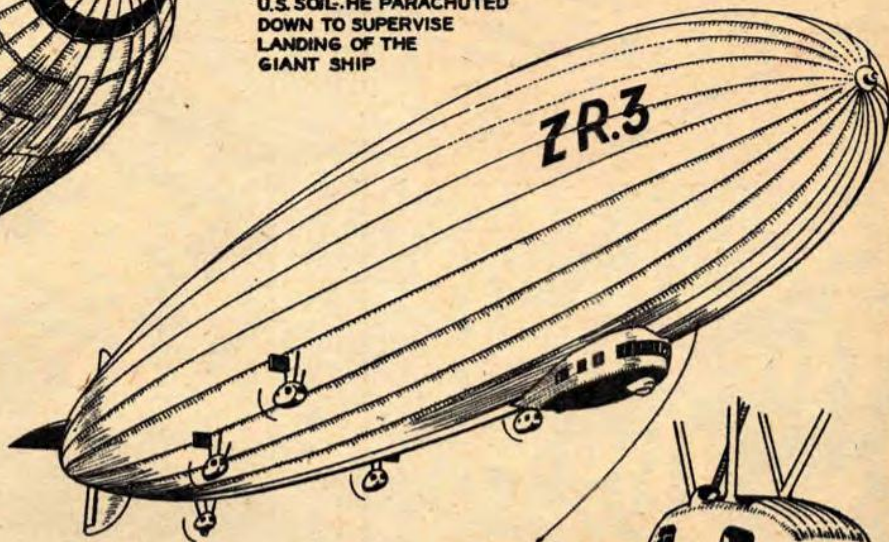
Alcock and Brown, the almost forgotten men, made their historic nonstop flight over the North Atlantic some eight years before Lindbergh's first nonstop New York-Paris flight. Actually it was a matter of pure luck that Alcock and Brown were first of the nonstop flyers. On May 18th, 1919, another pair of Englishmen—Harry Hawker and Grieve—took off



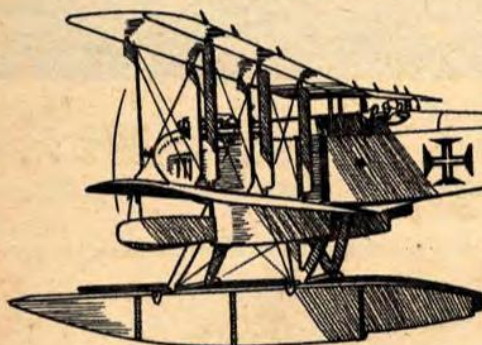


◀ 1919 BRITISH RIGID DIRIGIBLE R-34 WAS FIRST LIGHTER-THAN-AIR CRAFT TO MAKE THE NORTH ATLANTIC CROSSING AND FIRST AIRCRAFT OF ANY TYPE TO COMPLETE THE DOUBLE CROSSING. IT LEFT EAST FORTUNE, SCOTLAND, JULY 2 AND ARRIVED AT HAZELHURST, L.I., 108 HOURS LATER. RETURN FLIGHT REQUIRED 75 HOURS.—THE COMMANDER—MAJ. SCOTT WAS FIRST TRANSATLANTIC AIR TRAVELER TO SET FOOT ON U.S. SOIL. HE PARACHUTED DOWN TO SUPERVISE LANDING OF THE GIANT SHIP

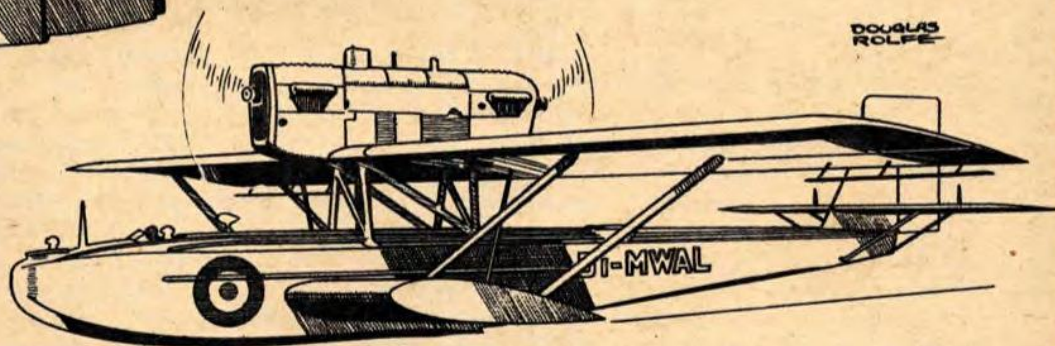
1924 GERMAN ZEPPELIN ZR.3 WAS ▶ SECOND AIRSHIP TO CROSS THE N. ATLANTIC AND BETTERED THE R-34'S WESTBOUND TIME BY SOME 27 HOURS. ON ARRIVAL AT LAKE-HURST IT WAS TURNED OVER TO THE U.S. NAVY BY ITS FAMED COMMANDER, DR. HUGO ECKNER, AND WAS LATER COMMISSIONED AS THE U.S. AIRSHIP "LOS ANGELES"



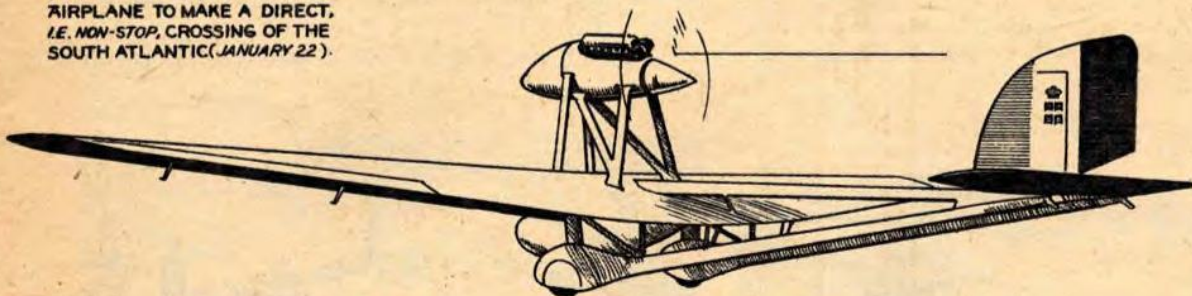
DETAIL OF ONE OF THE FIVE ENGINE GONDOLAS OF THE ZR.3. EACH HOUSED A 400 H.P. MAYBACH ENGINE (VEE-12)



1922 BRITISH FAIREY III ▲ (360 H.P. ROLLS-ROYCE ENGINE) WAS FIRST AIRPLANE TO COMPLETE A SOUTH ATLANTIC CROSSING. (MARCH 22 - APRIL 10, SACADURA CABRAL AND ADMIRAL COUTINHO OF THE PORTUGUESE NAVY, PILOTS)



1926 GERMAN DORNIER WAL (TWO 450 H.P. PAPIER LION ENG.) ▶ WITH MAJOR RAMON FRANCO AT THE CONTROLS THIS TANDEM-TWIN-ENGINE BOAT WAS FIRST AIRPLANE TO MAKE A DIRECT, I.E. NON-STOP, CROSSING OF THE SOUTH ATLANTIC (JANUARY 22).



◀ 1928 ITALIAN SAVOIA-MARCHETTI S-64 (550 H.P. FIAT ENGINE) PILOTED BY ARTURO FERRARIN THE S-64 TOOK OFF FROM ROME JULY 5TH. AND FLEW 4460 MILES TO BRAZIL—FIRST NON-STOP FLIGHT BETWEEN EUROPE AND THE SO. AMERICAN MAINLAND

from Newfoundland in a Sopwith biplane and actually covered 1,100 miles before a broken oil line forced them down into the sea from which they were providentially rescued by a passing freighter.

Aircraft shown on these pages illustrate the pioneer flights which took place in the conquest of both North and South

Atlantic Oceans. Many other notable flights were accomplished between 1927 and 1932, but those detailed here were the essentially pioneer flights. Although the "America" never made the trip she provided much valuable data for subsequent transatlantic aircraft. In final form the "America" mounted a third engine atop the wing at center front.



# The mysterious case of the de Schelde "FW 198"

**Swedish aircraft manufacturer enlists aid of Dutch concern to prove to U.S. fans that the much-publicized "FW 198" existed—but not as a German design!**

■ As far as Air Trails was concerned it all began in the spring of 1951. It can be traced to an innocent-appearing query from reader Kenneth Hands, Ellicott City, Md., who asked among other things, "I would like to know if the Focke-Wulf FW 200's and the 198's were used much, and if they were successful."

Part of our reply was a one-line sentence: "There was no such airplane as the FW 198." We doubt in the history of aviation that nine words resulted in more of an uproar. From all across America, from across the seas, from practically every country came angry messages.

No magazine had ever pulled such a boner, they said . . . according to spotters handbook so-and-so . . .

. . . why, thousands had even built solid scale models and here were the kit plans to prove that the 198 existed. . . and so far, far into many, many nights.

You see, we'd based our assertion on USAF technical publications and captured German air force reports; none of which ever mentioned a Focke-Wulf 198. But look at *Jane's All The World's Aircraft for 1940*, we were told (and in no uncertain terms!). And sure enough, big as life and twice as impressive, there was the FW 198!

But it was from correspondent William Green of London, England, that the real story came. Mr. Green wrote in part:

"I will tell you why this airplane did not appear in



S.12 was first original design of de Schelde Company. All-wood 4-seater had a 130 hp D.H. Gypsy Major; 134 mph; 620 mi. range.



S.20, 4-seat pusher-type personal and trainer aircraft flown in '40. Hirth HM 506A in-line 160 hp engine; 150 mph; 560 mi. range.





The "Scheldemus" was a very successful single-seat biplane with tricycle gear. With 40 hp Praga B 2-cyl. engine speed was 78 mph.



A flying boat version of the "Musch," the "Scheldemeeuw." Later redesigned with an all-metal fuselage. Used by Dutch flying clubs.

the German *Flugzeug Typenbuch*—it was *not* a German airplane.

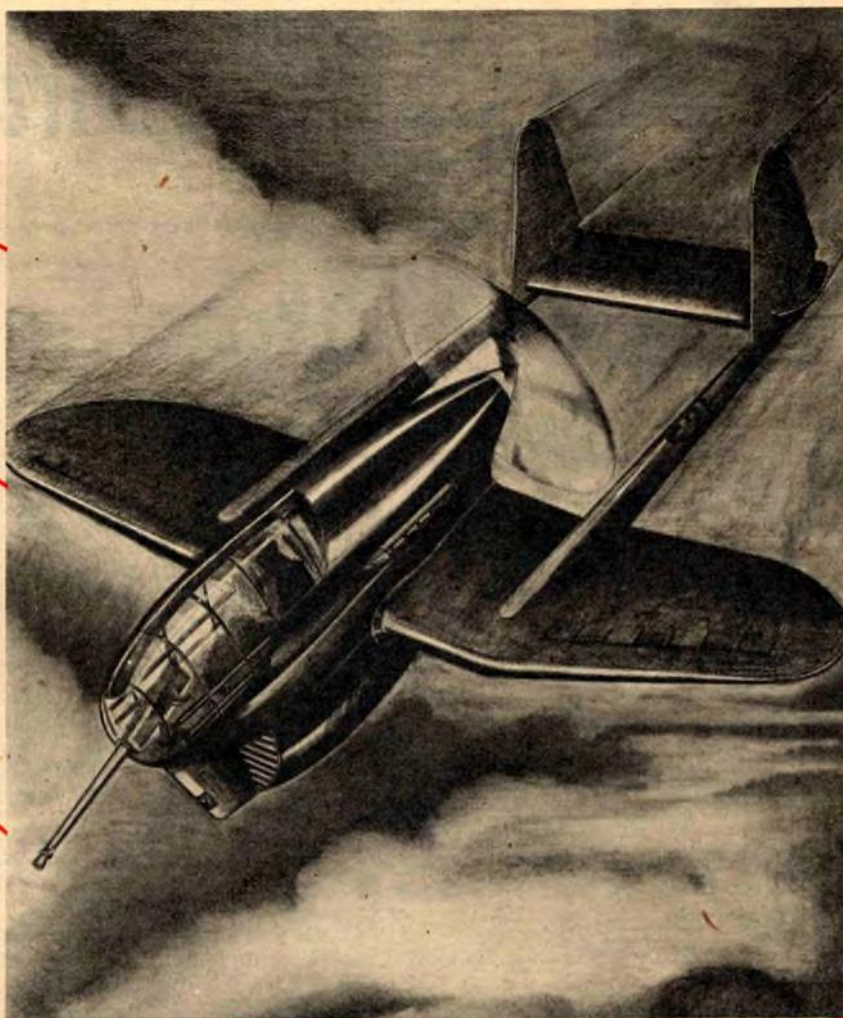
"The machine was actually the de Schelde S.21, built in 1938 by the *Koninklijke Maatschappij 'de Schelde'* at that concern's plant at Flushing, Holland.

"Powered by a 1,175 hp Daimler Benz DB 601 driving a pusher airscrew and carrying two 20-mm cannon, this airplane was later completed and, I believe, demonstrated at the National Socialist Congress of Nuremberg in September 1938 (as stated by another of your correspondents, Anthony Schmidt) where it evoked considerable interest from the *Luftwaffe*.

However, production orders were not forthcoming, although de Schelde were still tinkering about with the prototype when the Germans took over their plant.

"Thus, although no machine carried the designation FW 198, the machine usually known by this designation did exist.

"How did it become known as the Focke-Wulf FW 198? Well, before the war Holland's most prolific airplane manufacturer was the Fokker concern. The company's products were known throughout the world and, to the less well- (Continued on page 67)



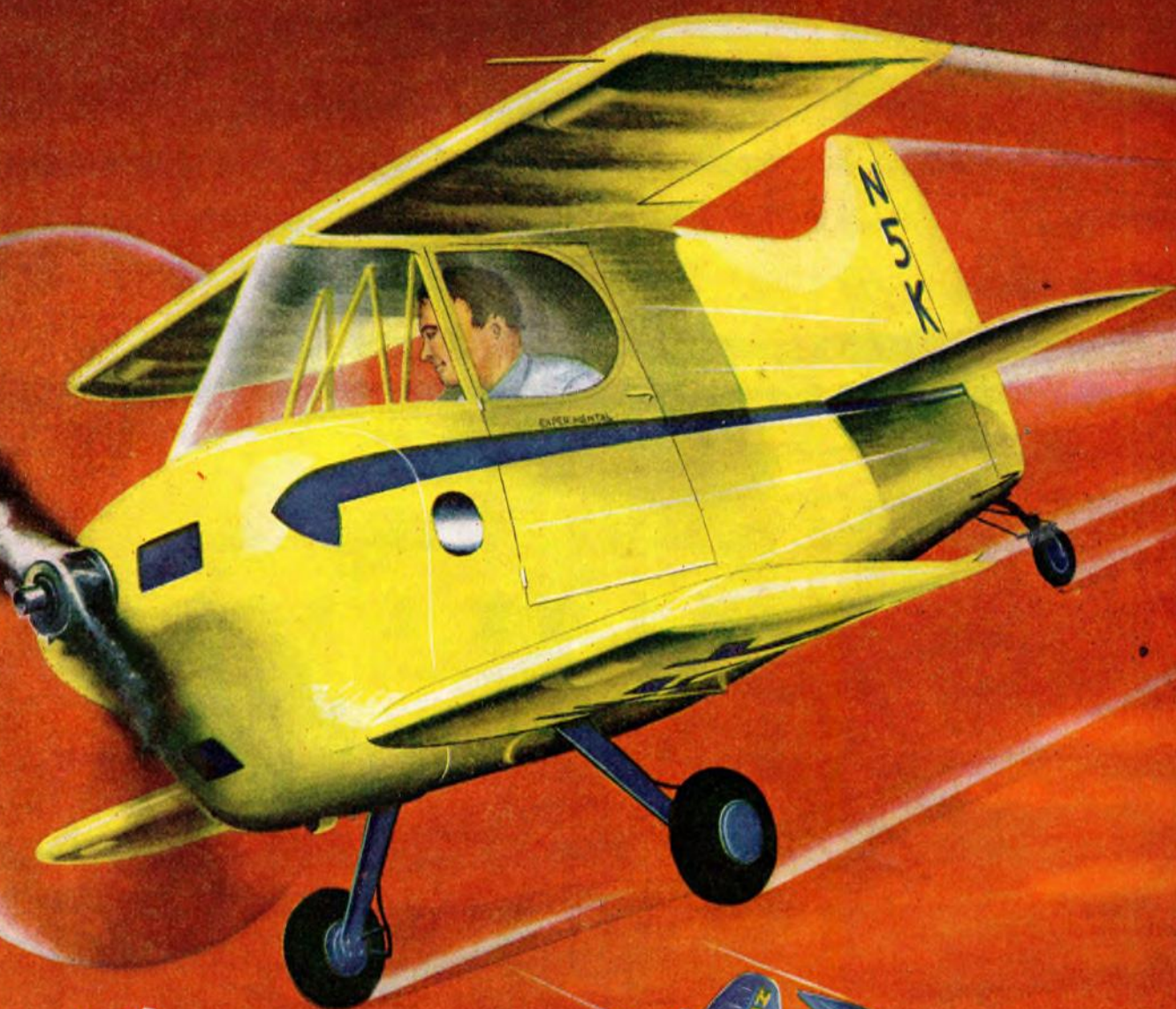
And, here, dear friends, is the S.21 which was erroneously tagged the "FW 198." Features were a movable forward-firing machine gun, a 23-mm cannon firing rearwards through the pusher prop hub and a bomber-type cockpit. Check with factory at Dordrecht (near Rotterdam)!



NOVEMBER 1952

35 CENTS

# Air Trails



**Special!**

Dick Everett's F. A. I.

A/2 "Nordic" Towline Glider

**Plus** — F8F Bearcat Carrier Model

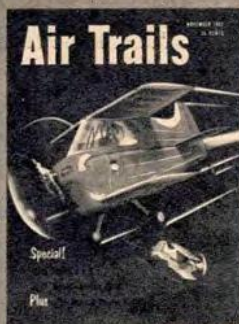


CAL SMITH



# AIR TRAILS

November  
1952  
Vol. 39, No. 2



Cover: Stitts' Sky Baby powered by 85 hp Continental engine—by S. Calhoun Smith

## FOR THE READER

- 10 R/C Roundup—Howard G. McEntee
- 12 Air Notes
- 14 Airmen of Vision
- 16 Today's Onlooker . . . Tomorrow's Pilot—Gen. Carl A. Spaatz
- 19 Interceptors beyond Sound—J. L. H. Peck
- 22 The World A-Wing
- 24 Air Progress: Heyday of the Lightplane—Douglas Rolfe
- 26 Aerobatics and the Buecker—Beverly E. Howard
- 28 F8F-2 Bearcat—S. Calhoun Smith
- 32 Picture Report on the Nationals
- 36 Air Model Manual: Adjustment of Free Flight Gas Models
- 38 Towliners Two: El Nordo II and El Sobo—Dick Everett
- 41 De Havilland DHC-3 "Otter" in 3-View—Bjorn Karlstrom
- 44 Perfidio—Gary B. Christiansen
- 47 We'd Like You to Meet
- 48 Berkeley's A/2 Savage
- 48 Henry Engineering's Mustang Stunter
- 49 Enterprise's Air Racer
- 49 Olson & Clark's El En Gone
- 50 Motor of the Month: Cameron .19
- 54 Dope Can
- 60 Western Roundup—Dick Everett
- 66 Sketchbook—Drawings by H. A. Thomas
- 68 R/C Primer: Moving the Control Surfaces, Conclusion—H. G. McEntee
- 70 How to Measure Thrust Offset
- 75 For Your Information
- 75 Contest Calendar
- 76 Showcase

## THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Editor: Albert L. Lewis. Technical Editor: Alexis Dawydoff. Editorial Production: Carl Happel. Art Director: W. F. Tyler. Editorial Assistants: Rose Borello and Rosalba Accardi. Special Correspondents—Washington: Kendall K. Hoyt; West Coast Modeling: Dick Everett.

### STREET & SMITH PUBLICATIONS, INC.

President . . . . . Gerald H. Smith  
Executive Vice President . . . . . Ralph R. Whitaker, Jr.  
Vice President and Secretary . . . . . Arthur P. Lawler  
Treasurer . . . . . Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 2550 Beverly Blvd., Los Angeles 4, Calif., and 681 Market St., San Francisco 5, Calif.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail. Post Office Dept., Ottawa, Canada. Copyright, 1952, by Street & Smith Publications, Inc. 35c per copy. This issue is Vol. XXXIX, No. 2. Please advise us if you move: allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## FROM THE READER

All communications to the editorial offices should be addressed to Air Trails, 304 E. 45th St., New York 17, N. Y.

**Bearcat vs. Tigercat . . .** A couple of days ago I made a solid model of the Grumman F8F Bearcat. I have also heard of the Grumman F7F Tigercat. Which was faster, the F7F Tigercat or the F8F Bearcat?

Tom Stengel, St. Louis, Mo.

• The F7F Tigercat is a twin-engine Navy and Marine fighter. It is slower than the F8F Bearcat.

**Baffle Plates . . .** I have noticed on several of your recent diagrams of jet planes (which I think are very interesting) so called "baffle plates." Would you please explain just what these are for?

Wayne Baldwin, Brady, Tex.

• In this instance, the "baffle plates" you mention serve to prevent progression of a stall toward the tip of the plane's wing. They act like dams rather than baffle plates and are also known as "aerodynamic dams."

**Lightplane Manufacturers . . .** I am interested in Lightplanes of the U.S., but I am unable to find the home offices.

Thomas Wilk, Lilly, Pa.

• Here are some addresses of lightplane manufacturers: Aeronca Manufacturing Corporation, Middletown, Ohio. Cessna Aircraft Company, Wichita 15, Kans. Luscombe Airplane Corporation, Garland, Tex. Mooney Aircraft Inc., Wichita, Kans. Piper Aircraft Corporation, Lock-Haven, Pa. Taylorcraft, Inc., Conway-Pittsburgh Airport, Conway, Pa.

**Color Scheme of Me. 109 . . .** I am building a Messerschmitt 109. Could you please tell me the color scheme of a Me-109 at the beginning of World War II?

Martin Wood, Jewett City, Conn.

• Some Messerschmitt 109's were painted dark blue upper side, a light blue underside at wing tail and fuselage, with yellow or red spinners.

**Designation Letters . . .** Does the de Havilland Vampire have radar and is it a two-man plane? What does the letter "P" enclosed in a circle mean? I've seen it on pictures of almost all British jets. What does "Y" mean in USAF designation, such as YF-93 or YF-86D? What happened to the Curtiss XF-87 "Blackhawk" four-jet night-fighter?

Thomas G. Hart, Waterford, Pa.

• Two-place N.F. Vampire (Night Fighter) is equipped with radar. Letter "P" in circle on the British plane means it's an experimental aircraft. Letter "Y" as in YF-93 means this model is in service test status. The Curtiss F-87 Blackhawk was canceled out.

**Prop from Real Plane . . .** I wish you could tell me where I can get a prop from a real plane. If so, how much will it cost and where can I send for it?

Mel Gardini, North Chicago, Ill.

• To obtain a propeller, suggest that you write to Karl Ort, York, Pa. He has some available from \$3 and up—depending on size.

**What Prop? . . .** I have a model airplane (FF) powered by one of the small Half-A motors. I spent much time in building it and I was pleased with the results. But when it came to flying, the thing would not get more than ten feet from the ground.

Allow me to tell you that I have been building rubber-powered models of all kinds for four years and this is my first gas-powered model and I do not think that the plane is too heavy.

I used a 6" dia., 3" pitch propeller and as I do not know much about these things I would like to know if another propeller is more suitable.

I would in addition like to know the meaning of the "pitch" and if more pitch would in turn mean more speed and so on.

Robert Chouinard, Montreal, Can.

• Perhaps a 5 1/4 prop will help a lot. The engine should turn up at least 10,000 rpm. Your model weight might be too high. 6 1/2 to 7 oz. is pretty high for a small flying scale model. Pitch is the distance the prop would move in one revolution if it were travelling through a solid substance such as water.

**Curtiss Tail-first Fighter . . .** Do you have any pictures of the Curtiss-Wright experimental tail-first fighter "Blue Goose." Why wasn't it put into production? Also, what was its designation?

My dad formerly worked with Curtiss-Wright and he thinks it was XF-2. Is this right?

C. B. Hammond, St. Louis, Mo.

• The only Curtiss tail-first fighter that we know of was the experimental XP-55 Ascender. We believe it was not too successful; anyhow, the Air Force did not order them.

### SUBSCRIPTION PRICE

\$3.50 per year in U.S. and Possessions; \$4.50 per year in Canada; \$7.00 per year in countries of the Pan American Union; \$10 elsewhere.

### NOTICE TO SUBSCRIBERS

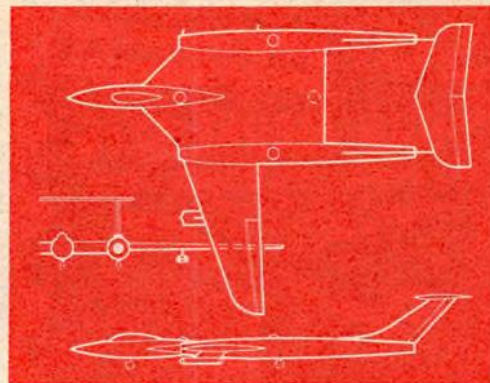
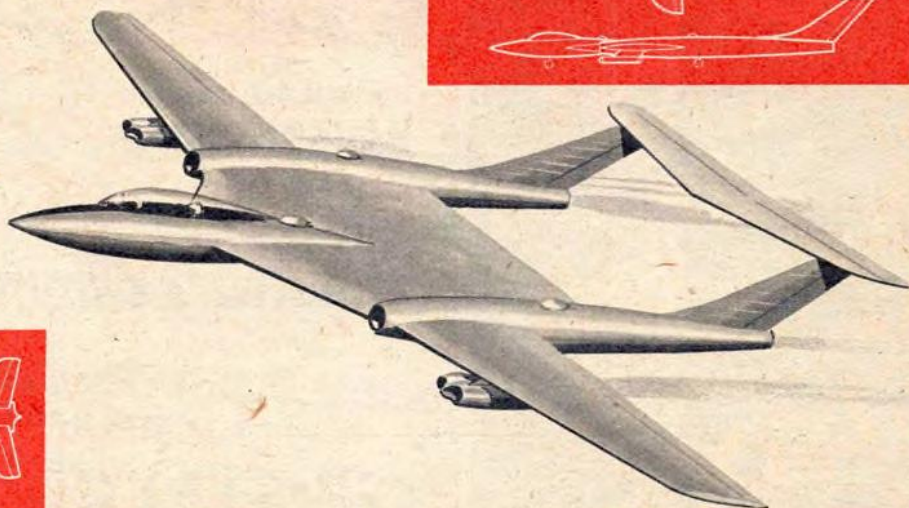
Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th Street, New York 17, N. Y.



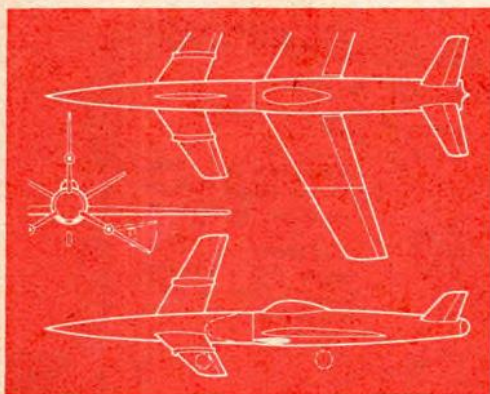
# Airmen of Vision

## DESIGN COMPETITION

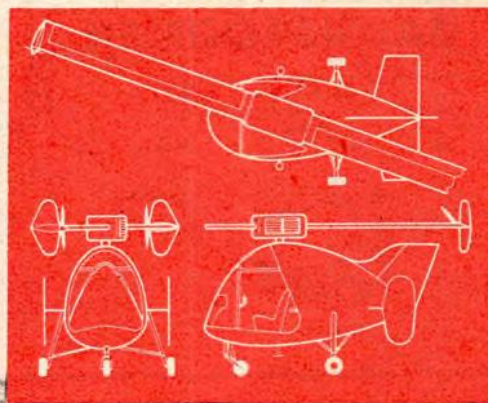
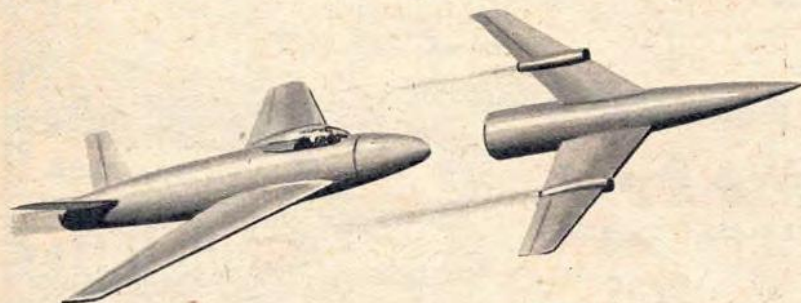
Top honors of the month go to Warren Chitwood of Los Angeles, Calif., for design of a long-range jet bomber. Has six jet engines, two in the tail booms equipped with afterburners and four in pod-type nacelles under wings. Armed with twelve 20-mm cannon and capable of carrying two parasite fighters. Top speed is 600 mph. Range 8000 miles.



Thunderhead is name of this airplane-guided missile combination by Jerry Gibson of Huntsville, Ala. The carrier is powered by two turbojets, the missile by four solid-fuel rockets. When combination is in range of enemy bomber, missile is launched by pilot of mother-plane. Touchy CG problem.



Torqueless helicopter by Georges Chaulet of Antony, France. Engine located in rotor head, drives tip propellers through shafts. Fins at tips provide automatic stability for hands-off flying. Pitch angle of blades is varied through aileron-like controls on rotors. Rotor dia. 25 ft. Speed 73 mph.



Air-Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information of power plant(s) estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The design may be of any type: commercial aircraft, military planes (fighters bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payments of \$5 will go to the runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N.Y. Editors regret that because of large number of entries they cannot enter into correspondence on A. of V.



# Interceptors beyond Sound

**Radar and electronic gadgets will turn the future supersonic 'ceptor into "bird dog" aloft**

■ You relax with several of your squadron buddies in the big trailer that serves as the mobile ready room. A light but steady October rain drums against the metal roof. You pilots of B Flight are on "standby," which means that you are to be ready to "scramble" within two minutes.

Then it comes. The loudspeaker squawks terse take-off orders. Grabbing helmet and oxygen mask, you sprint to the nearby revetment where the delta-winged interceptor squats ready for almost immediate take-off.

The crew chief jerks away the protective tarpaulin, then makes an adjustment on the rocket engine as you worm into the cockpit. You become busier than the proverbial one-armed paperhanger: uncage flight instruments, switch out circuit breakers, release lock. Then you hook up,

By JAMES L. H. PECK

Harold Stevenson



## "Here are the facts..."

■ You might well pick up a late 1954 issue of *Air Trails* and read a pilot's story of an action generally similar to this. The "sonic interceptor" program happens to be one of the USAF's hottest and most important projects.

Despite the Buck Rogers aspect, all the elements for this significant tactical scheme exist right today in varying degrees of workable form:

- The electronics equipments described in this narrative in an elementary and simplified fashion have been under development at Hughes Aircraft for two years. More recently, parallel projects have been undertaken by General Electric, Sperry Gyroscope, and North American Aviation.

- Several months ago it was announced that Convair had been awarded the prime contract in a spirited competition of interceptor entries submitted by most of America's leading builders of fighter aircraft, including North American, Republic, Lockheed, and McDonnell.

- Air-to-air missiles fully capable of radar homing at ranges exceeding five miles have been field-tested. AAM of a size which such a fighter plane could carry exists in the Falcon and somewhat larger Sparrow. An interceptor could carry a single, larger AAM such as the 1500-lb. Oriole and the smaller Meteor. All these missiles and others are well along in development or service-test status.

- The automatic fighter control scheme has been tested—as early as two years ago—in significant flights at Edwards Air Force Base, Muroc, Cal.

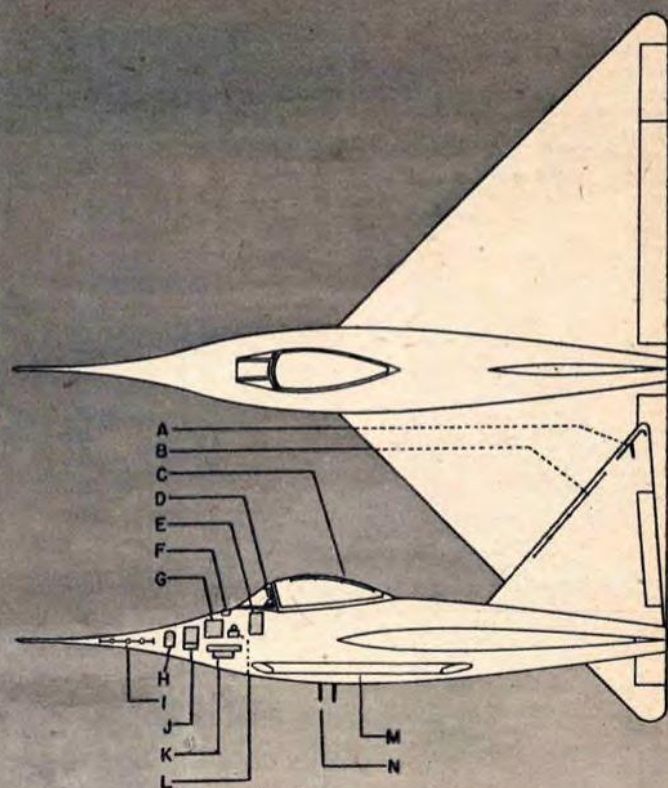
- The radar sight described here has the same general characteristics of the A-1C and J-1 fighter sights which have drawn the bead on many a MiG over Korea during the past 15 months.

- An airframe of roughly the same configuration has undergone exhaustive flight testing at Edwards AFB in the form of the Convair F-92A. And it was announced officially that the designation of the first sonic interceptor will be XF-102.

### Significance:

Tactically speaking, the scheme is an operational gimmick for making a surface-to-air missile (SAM) out of an airplane and an air-to-air missile (AAM). But even if SAMs such as *Terrier*, *Nike*, *Loki*, or *Gapa* were fully operational right today, the AAM-carrying interceptor would still retain certain tactical advantages:

- This missile carrier would be able to engage the enemy farther out, attacking him from 75 to 100 miles away from his intended target. This is a vital consideration, since we can presume to be operating against atom-carrying bombers. The surface-to-air missile does (Continued on page 74)



fastening the shoulder harness and safety belt. You plug the oxygen hose and radio connections into the "quick-detach" tube, then make a fast mental check-off.

To prepare for the rapid ascent to altitude, you start breathing oxygen immediately. You adjust cabin pressurization, turn on the generator, and motion to the crew chief with a thumbs-down gesture to start the auxiliary power unit (APU) that is plugged into a fuselage connection.

Your right hand holds down the starter button while your left sets the control boost and fuel selector switches. Then your left hand darts over to the battery switch as the turbojet revs up to 5 percent power. You let go of the starter: it will continue turning and disengage automatically when the engine revs up to about 18 percent power. The APU is disconnected. You move away on the taxi-out. Your buddies will follow you off at regular two-minute intervals.

The mobile control tower is just dimly visible through the late afternoon mist as you exchange a few words of radio conversation. Then you swing onto the runway and ease the throttle forward. The triangle-shaped plane accelerates. It is almost an instrument take-off, with nothing but gloom shrouding the runway up ahead.

As soon as the interceptor is airborne you retract the gear. Then you suck up the wing flaps, retard the throttle to 96 percent power, and flick on a toggle



### KEY TO THREE-VIEWS

- A. Pick-Axe antenna (Receiver, Command Set)
- B. Fin antennae (Telemetering and Remote Control)
- C. Canopy antenna (Command Set)
- D. Gunsight head
- E. Remote Flight Control unit
- F. Range servo
- G. Flight Control transmitter
- H. Modulator
- I. End Fire antenna
- J. Computer power supply
- K. Amplifier servo
- L. Gunsight inverter
- M. Missile launcher tubes (2)
- N. IFF antennae

Enemy detected and identified by early warning radar, then picked up by "acquisition radar." 1. Interceptors are scrambled. 2. Automatic Fighter Controller takes over. 3. As radar continues to track, interceptor climbs. 4. Makes contact with own radar and fires missile.

switch marked **TELEMETERING**. The emergency fuel pump is switched off, and you move two switches to prime the rocket engine. At 500 feet you flip still another switch labeled **AUTO**, and speak into the microphone, "Baker Leader, ready for automatic."

A voice crackles in the headset, "I've got you, Baker Leader."

You fire-up the rocket engine. A high-pitched shriek merges with the low rumble of the J-57 turbojet. You're pressed against the back of the seat as the plane surges upward in a 45-degree climb.

You let go of the controls.

Now you try to relax. From here on in you are practically a passenger going along just for the ride. Technically, though, you're called a "pilot monitor." The someone else who is flying your ship is the AFC (Automatic Fighter Controller) down on the ground a few miles from the airdrome.

Wearing a headset and throat mike, this officer—who is himself a crack fighter pilot—sits attentively before a large console. He manipulates delicately with his right hand a miniature control stick that guides your interceptor as he watches the large radar scope and three lines of winking, vari-colored lights. The display he watches is the scope of the "acquisition radar" that goes into action after the hostile craft have been picked up by the larger early warning radars miles away. This acquisition radar tracks the enemy planes continuously. By maneuvering the radar blip that represents your plane on an inter-

ception course with the enemy blips, the AFC will put you in position to attack with the air-to-air missiles snuggling in the belly of your delta interceptor. Then the AFC will fly you back home.

You feel the ship bank onto a new course as the AFC vectors you by remote control toward the hostile bombers. The plane bores up through murky nimbus, then high above you see a secondary overcast of cirro-stratus. You streak into this layer at 22,000 feet. And it seems like flying through a milky white fog through which the sunlight filters dimly. About 31,000 feet you burst through into a silvery explosion of dazzling sunlight and indigo blue sky. It's just two minutes since you took off.

Down on the airdrome, Baker Two is just rolling down the misty runway. At the same console—but with an additional control stick—the same AFC who is flying your plane will "handle" this second interceptor. Another controller will fly the following two planes, and so on until the flight is airborne.

You watch the sky vault around you turn to a deeper indigo shade. At 45,000 feet it becomes navy blue. Then the firmament takes on a purple-black cast at 50,000 feet. The sun is a bright orb fairly low in the west. But to the eastward, down-sun, you can see distinctly a number of stars. You appreciate now why electronic navigation and sighting are so essential to high-altitude operations.

The interceptor levels off at 60,000 feet. The only way you know it's level is (Continued on page 53)



# The World A-Wing



Sweden's production version of SAAB J-29 jet fighter equipped with auxiliary fuel tanks and rockets making a Jato. Service model has 5000-lb. thrust DH Ghost.

Below: Italy's popular lightplane Macchi M.B. 308, now in service with Italian Air Force as liaison plane. Inset shows racing version with streamlined windshield.



Honey Bee, built by Beecraft Associates of San Diego, Calif., a firm formed by makers of Wee Bee. All-metal single-seater with butterfly tail; 65 hp; 28 ft. span.





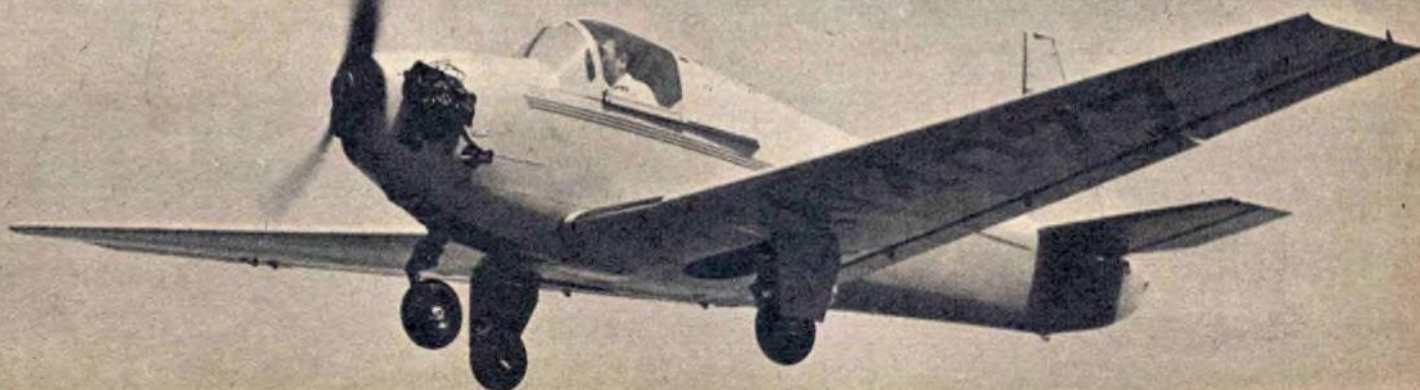


Hindustan HT-2, an all-metal trainer for the Indian Air Force. Except for engine, prop and instruments, all components designed and built in India. 155 mph tops.

Below: SAAB 91B Safir, primary trainer of the Swedish Air Force. Powered by a 190 hp six cylinder Lycoming engine, the plane has a rated top speed of 175 mph.



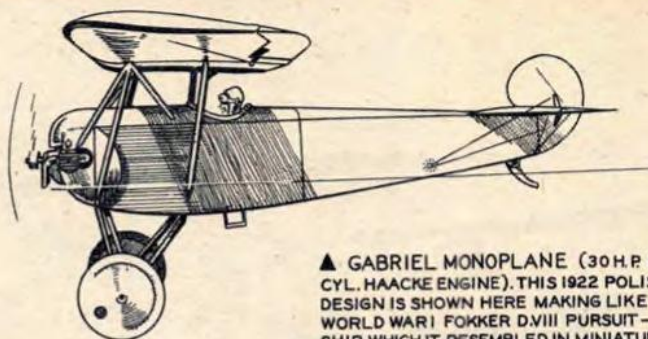
Mooney M-18L. 1952 version of the popular sports single-seater. Additional streamlining increased performance. Choice of 65 hp Lycoming or Continental.



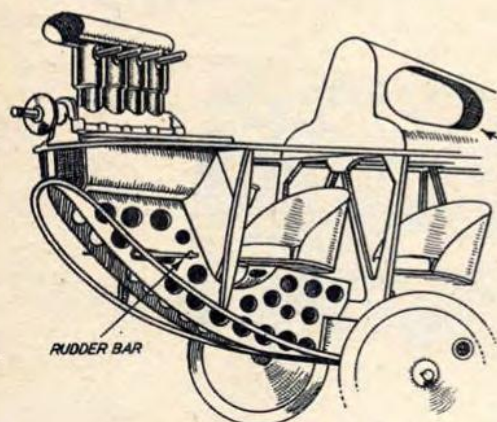


# AIR PROGRESS

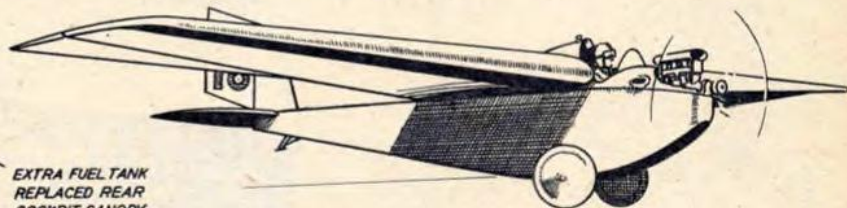
By DOUGLAS ROLFE



▲ GABRIEL MONOPLANE (30 H.P. 2-CYL. HAACKE ENGINE). THIS 1922 POLISH DESIGN IS SHOWN HERE MAKING LIKE A WORLD WAR I FOKKER D.VIII PURSUIT—A SHIP WHICH IT RESEMBLED IN MINIATURE



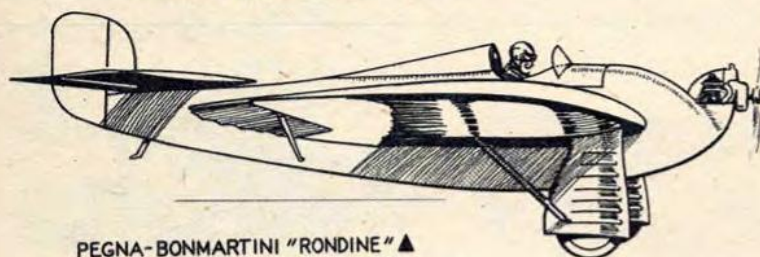
▲ INSTALLATION OF THE 17 H.P. SERGANT ENGINE ON THE PONCELET "VIVETTE" REVEALS SOME OF THE NOVEL STRUCTURAL FEATURES OF THIS DESIGN. THE EXTREME FORWARD POSITION OF PILOT IS WORTHY OF NOTE AS IS THE CANTILEVER ENGINE MOUNT



▲ PONCELET "VIVETTE" (17 H.P. SERGANT ENGINE). A 1923 BELGIAN DESIGN OF CONSIDERABLE INTEREST.—IT COULD BE OPERATED EITHER AS ONE OR 2-SEATER

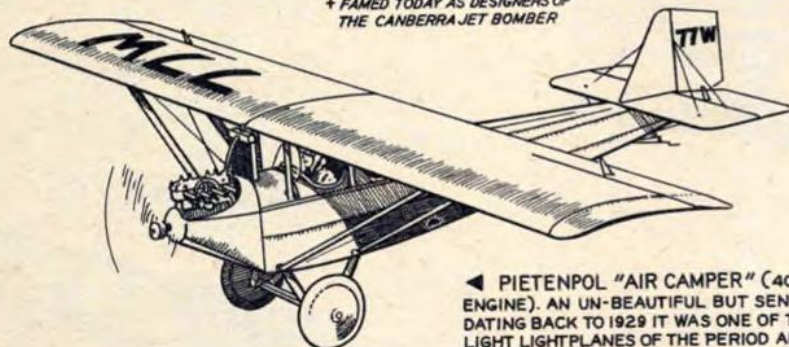


▲ PARNALL "PIXIE III" (VARIOUSLY POWERED UP TO 32 H.P.) WAS A CONVERTIBLE MONO-BIPLANE WITH SEMI-CANTILEVER LOWER WINGS AND UNBRACED REMOVABLE UPPER WING.—IT PLACED 6TH IN THE 1924 ENGLISH LIGHTPLANE TRIALS

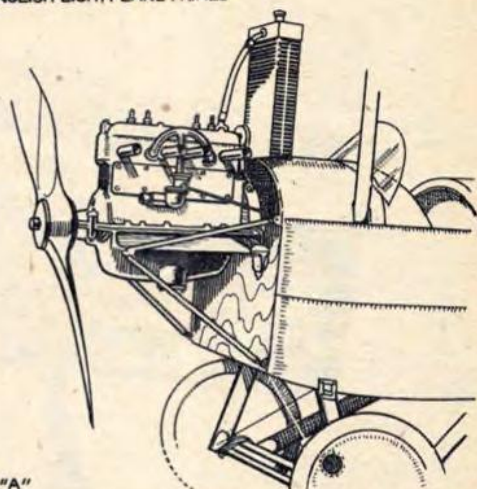


PEGNA-BONMARTINI "RONDINE" ▲ (2-3/4 H.P. A.B.C. ENGINE). AN ITALIAN VENTURE IN THE ULTRA-LOW POWERED FIELD AND ONLY OTHER PLANE BESIDES THE ENGLISH ELECTRIC CO'S 1923 WREN TO FLY SUCCESSFULLY WITH THIS MOTOR

★ FAMED TODAY AS DESIGNERS OF THE CANBERRA JET Bomber



◀ PIETENPOL "AIR CAMPER" (40 H.P. FORD "A" ENGINE). AN UN-BEAUTIFUL BUT SENSIBLE DESIGN DATING BACK TO 1929 IT WAS ONE OF THE BEST U.S. LIGHT LIGHTPLANES OF THE PERIOD AND EASY TO FLY



▲ DETAIL OF THE FORD MODEL "A" PIETENPOL CONVERSION INSTALLATION

## HEYDAY OF THE LIGHTPLANE (1922-29)

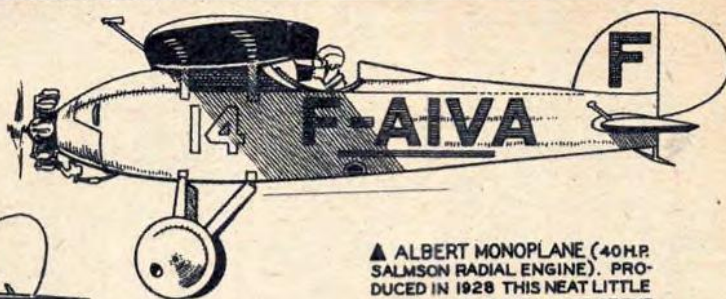
This is the third or fourth time that the pages of Air Progress have been devoted to the absorbing subject of very light airplanes. This time a variety of designs has been selected from a number of different countries and all dating from 1922 to 1929.

As has been pointed out in the previous series, most early airplanes were in fact lightplanes, but what came to be known as the "lightplane movement" originated in England about 1922 when quite a few leading manufacturers as well as enthusiastic amateur builders entered various designs in the Lympe Lightplane Trials. Most of these early lightplanes suffered from inefficient





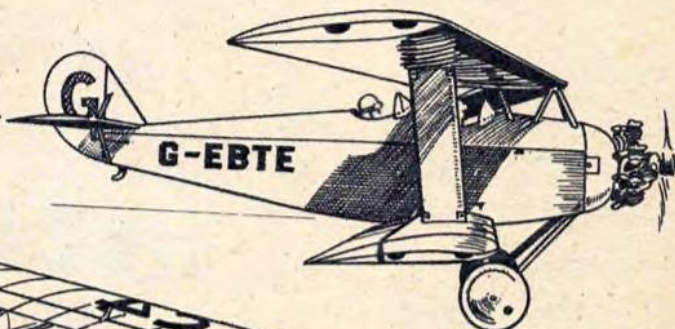
▲ FELIXTOWE C.L.A.4 (32 H.P. BRISTOL CHERUB ENGINE) BUILT BY THE MEMBERS OF AN ENGLISH LIGHTPLANE CLUB IN 1928 THIS LITTLE BIPLANE COMPARED FAVORABLY BOTH IN APPEARANCE AND PERFORMANCE WITH THE BEST TAILOR-MADE LIGHTPLANES OF THE PERIOD.



▲ ALBERT MONOPLANE (40 H.P. SALMON RADIAL ENGINE). PRODUCED IN 1928 THIS NEAT LITTLE SINGLE-SEATER WAS ONE OF THE BEST OF MANY FRENCH DESIGNS



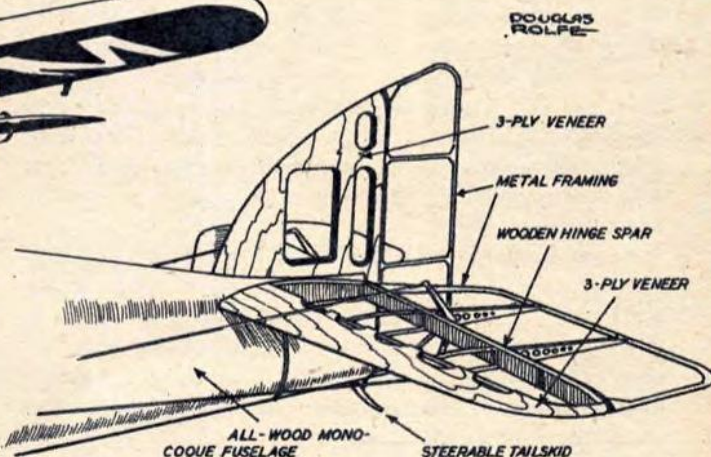
HEATH PARASOL (20 H.P. HEATH-HENDERSON MOTORCYCLE ENGINE). PROBABLY THE MOST WIDELY FLOWN U.S. LIGHTPLANE DURING THE TWENTIES IT COULD BE PURCHASED IN FLYAWAY OR KNOCK-DOWN FORM



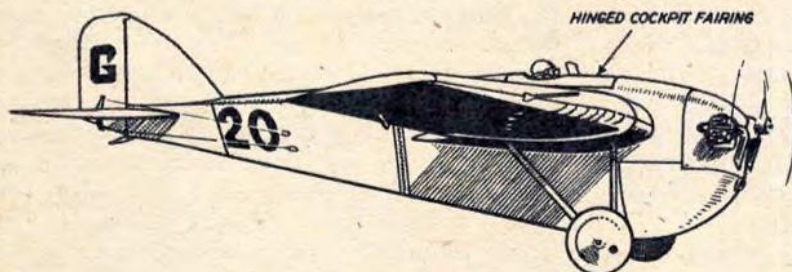
▲ PARNALL "IMP" (60 H.P. ARMSTRONG-SIDDELEY GENET ENGINE). ALSO A 1928 DESIGN THE "IMP" WAS LARGER, MORE POWERFUL, THAN THE "PIXIES"



PANDER MONOPLANE (25 H.P. ANZANI ENGINE), HAILED FROM HOLLAND AND WAS NOTABLE FOR ITS EXCELLENT ENGINEERING, CLEAN LINES AND LACK OF THE VICES USUALLY FOUND IN SHIPS OF THIS SIZE



▲ DETAIL OF THE PANDER TAIL ASSEMBLY SHOWS SIMPLE WORKMANLIKE CONSTRUCTION WHICH CHARACTERIZED THIS 1925 DESIGN.



◀ R.A.E. "HURRICANE" (32 H.P. BRISTOL CHERUB ENGINE). A COMPLETELY AMATEUR PRODUCTION, IT WAS ONE OF THE WINNING DESIGNS IN THE 1925 LIGHTPLANE TRIALS HELD AT LYMPE, ENGLAND

powerplants, though flew surprisingly well if engines were functioning properly.

Judging from the different countries represented in this modest selection, the movement spread and some very neat home-made jobs appeared both here and abroad. What killed the purely amateur design was the introduction of government regulations

which involved expensive stress analyses. The Pietenpol and the Heath parasols survived for a while because both were commercially produced—although the Pietenpol was actually an amateur design and garage built. This was also one of the few lightplanes to fly successfully with a converted car engine and had a satisfactory performance with two passengers, although a bit on the slow side.



DECEMBER 1952 / 35 CENTS

# Air Trails®



## Triple-Threat Treat—

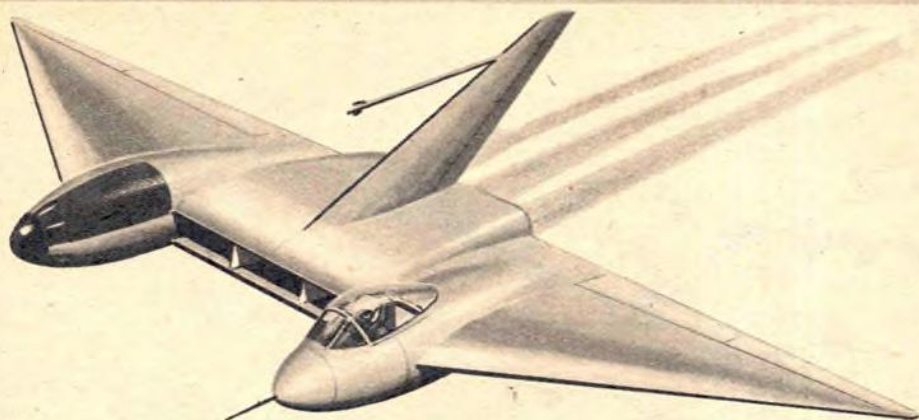
World War II Fighters:

Messerschmitt 109E

Spitfire MK II

P-51K Mustang

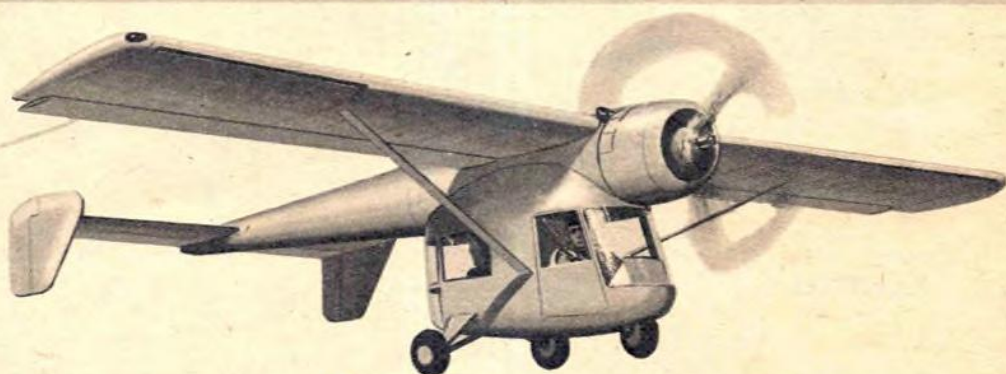


**1<sup>ST</sup>****Twin-fuselage jet bomber**

Best design of the month, a 3-jet light bomber by Ernie Heim of Detroit, Mich. Interesting and unusual feature is double fuselage, with crew cockpit in left pod, while right one has radar, armament and extra fuel tanks, thus leaving plenty of space for the personnel. Engines generate 6000 lbs. of thrust each. Span 50 ft., length 42 ft. Top speed around 700 miles per hour.

**2<sup>ND</sup>****Light utility transport**

Commercial or military utility transport. A joint effort by Cluff Dilley and Fred Pierce of Ephrata, Wash. Can be used as cargo plane by removing rear seat. Loading is from rear, by removing back window. Full span flaps and slots give good small field take-off and landing characteristics. Span 40 ft. Engine 200 hp. Top speed 125 mph. All-metal construction.

**3<sup>RD</sup>****Hi-visibility attack plane**

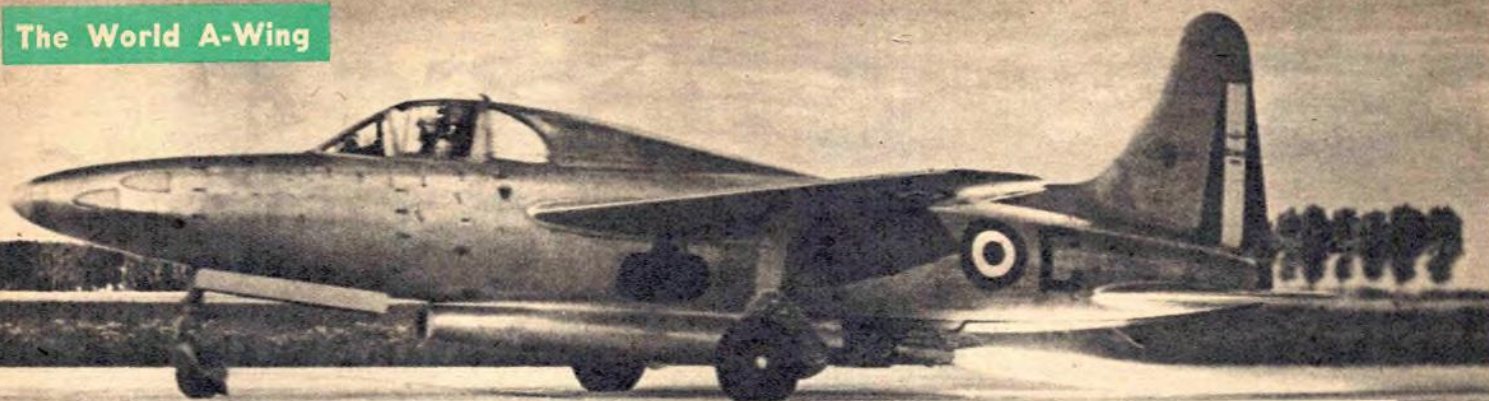
Carrier-borne attack plane by Pvt. Gerard Chaplain, formerly of France, now of Amarillo, Tex. Special feature of craft is location of cockpit to give better vision during take-off, bomb run and landing. Powered by one 5500 hp turboprop plus two small jet engines of Turbomeca Marbore type to assist take-off. Six 30-mm cannon in front and one 20-mm in rear, plus bombs and rockets.

## AIRMEN OF VISION DESIGN COMPETITION

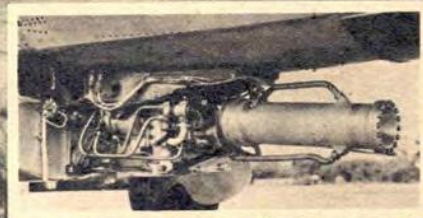
Air-Trails has opened its columns to those who are interested in presenting plans for "aircraft of the future." Rules governing the competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and

judges. The design may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to the runner-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that because of large number of entries they cannot enter into any correspondence on Airmen of Vision.





SO-6025 Espadon French jet fighter. Powered by RR Nene engine and S.E.P.R. liquid fuel rocket (at right) for thrust augmentation. Fourth prototype of Espadon.



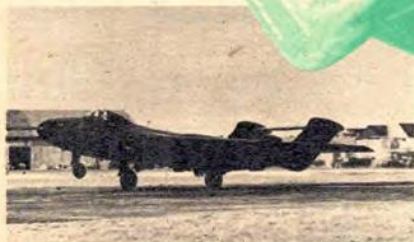
Below: Britain's latest turboprop airliner, the Bristol Britannia. Powered by four Bristol Perseus engines of 3780 hp each, Span 140 ft. Cruising speed 360 mph.



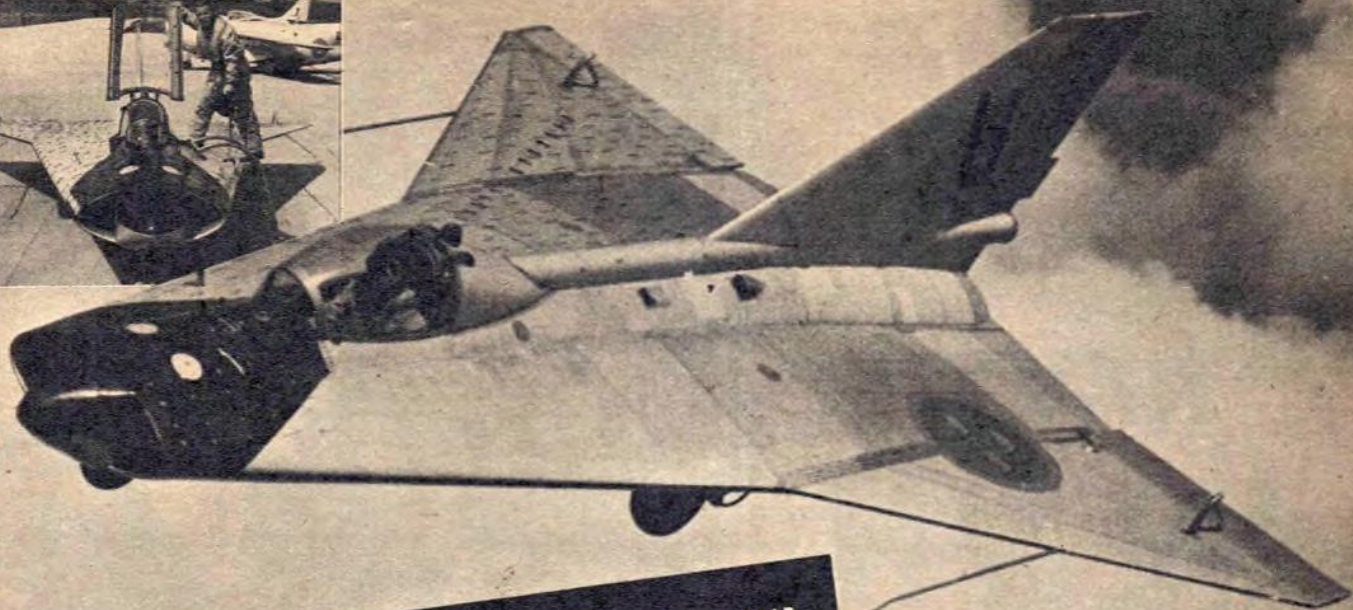
DeHavilland DH 110 all-weather interceptor (below) is plane that crashed in Farnborough killing 29. Type has exceeded speed of sound on numerous occasions.



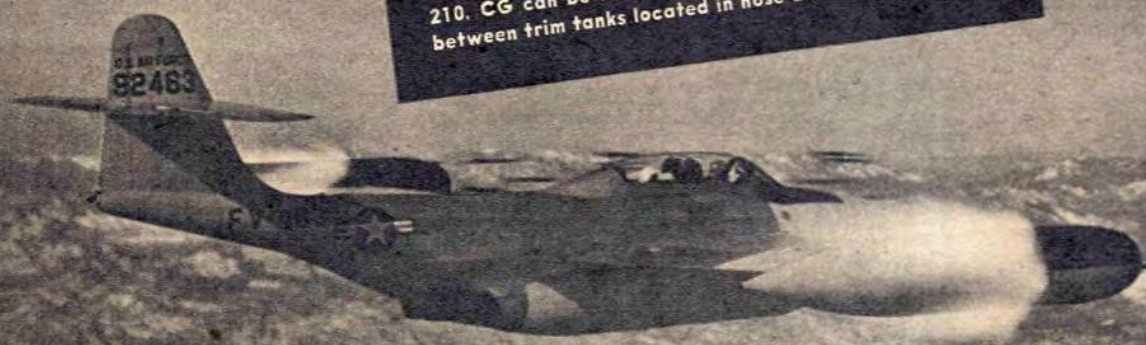
## New Shapes in the Sky





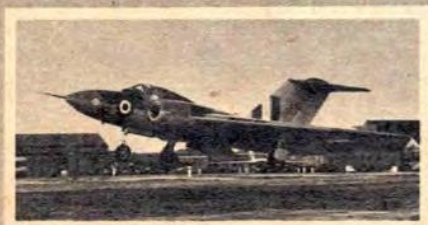


Sweden's tiny double-delta research monoplane, SAAB 210. CG can be moved during flight by pumping liquid between trim tanks located in nose and tail. Span 16 ft.



Northrop F-89D Scorpion equipped with "Grand Slam" rocket installation. Aiming and firing the 2.75" rockets from the wingtip nacelles is electronically controlled.

Below: Gloster G.A.5 Javelin all-weather delta interceptor as it appeared at Farnborough show. Span 52 ft. Length 57 ft. Two Sapphires of over 8000-lb. thrust.

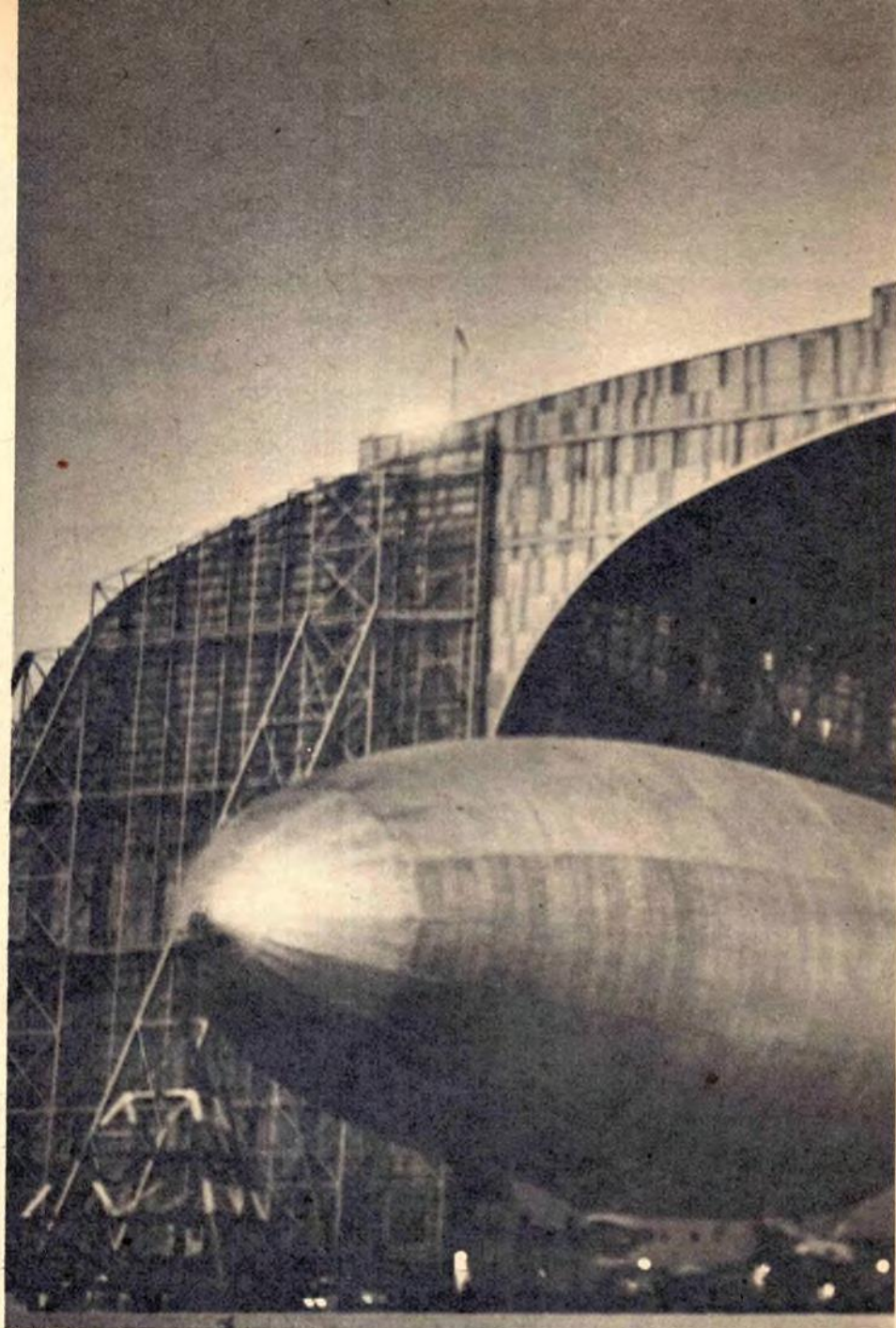




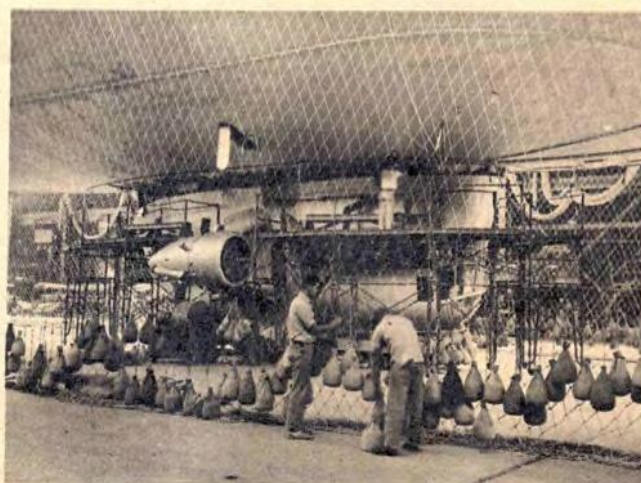


# NAVY'S NAN

Navy's latest dirigible, the Good-year-built ZPN, or Nan in Navy parlance, is the largest non-rigid blimp in the world, with a capacity of 875,000 cu. ft. and an envelope length of 324 ft. It carries a crew of 16 and is fully equipped with all facilities for comfort. Inasmuch as it is destined for anti-sub patrol it carries elaborate electronic equipment and armament for search and destruction of underwater foe. Power is supplied by two Wright R-1300s of 800 hp each. Ruddevators give A-1 maneuverability.



Starting the inflation process of a blimp bag. Shown here is the K-type, smaller than the ZPN. When the fabric bag is partially inflated, a rope mesh is put over it and weighted with sandbags.



Rope mesh insures even inflation and prevents bag from turning over. Each sandbag weighs 35 lbs. 300 are used during inflation. By changing number and position of bags, envelope shape is controlled.





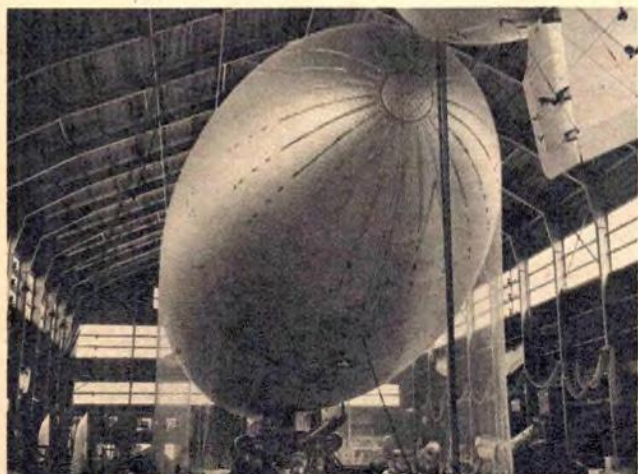
ZPN's engines are located inside of car, driving 2 18' props via extension shafts.



Close-up of Nan's 83 ft. car. Tricycle landing gear retractable. Note bottom radome.



At Lakehurst, N.J., NAS, where Nan is under test, she is moored to portable mast.



View of the ZPK type blimp with weighted rope mesh. The bag is fully inflated and the car is attached. Mesh has over 180,000 knots. It takes four hours to fully inflate a K-blimp, 10 for ZPN type.

DECEMBER, 1952



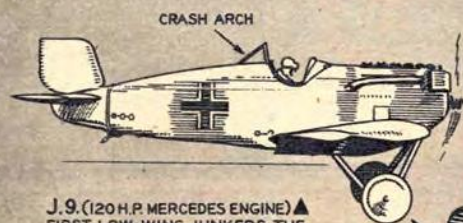
Part of the assembly line method of reconditioning, repairing and modifying gondolas. Blimps are completely torn down and overhauled every two years, each part being carefully weighed.



# AIR PROGRESS

By DOUGLAS ROLFE

## THE JUNKERS STORY



J.9. (120 H.P. MERCEDES ENGINE) ▲ FIRST LOW-WING JUNKERS THE J.9. APPEARED IN 1917 AND COULD CLIMB TO 16500 FEET IN 23 MINS.

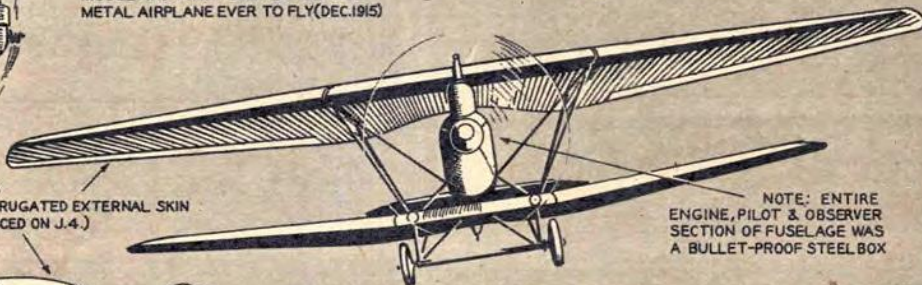


J.1. "THE TIN DONKEY" (120 H.P. MERCEDES ENGINE) WAS FIRST JUNKERS MODEL AND FIRST COMPLETELY ALL-METAL AIRPLANE EVER TO FLY (DEC. 1915)

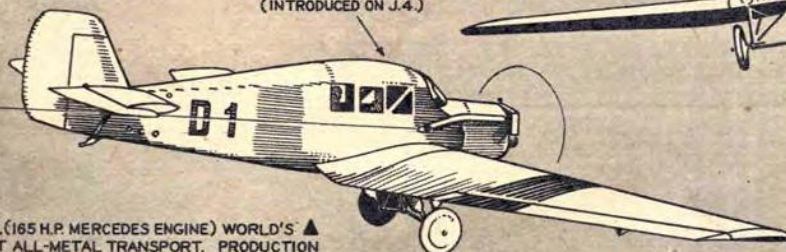
SMOOTH EXTERNAL SKIN STIFFENED BY INTERNAL CORRUGATIONS

NOTE EARLY USE OF BELLY TYPE NOSE-RADIATOR

CORRUGATED EXTERNAL SKIN (INTRODUCED ON J.4.)

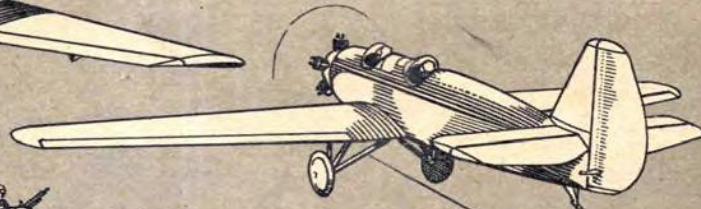


NOTE: ENTIRE ENGINE, PILOT & OBSERVER SECTION OF FUSELAGE WAS A BULLET-PROOF STEEL BOX



F.13. (165 H.P. MERCEDES ENGINE) WORLD'S ▲ FIRST ALL-METAL TRANSPORT. PRODUCTION MODEL EQUIPPED WITH A 185 H.P. B.M.W. ENGINE AND REDESIGNATED D-1, FIRST FLEW IN JULY, 1919—WAS STILL IN SERVICE AT END OF 1939.

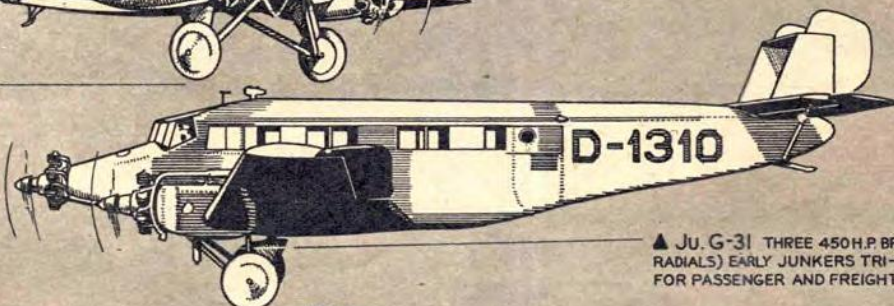
▲ J.4. "THE FLYING TANK" (120 H.P. MERCEDES) WORLD'S FIRST ALL-METAL LOW-LEVEL ATTACK PLANE AND FIRST OPERATIONAL JUNKERS MILITARY AIRCRAFT WAS FLIGHT-TESTED JAN. 19, 1917



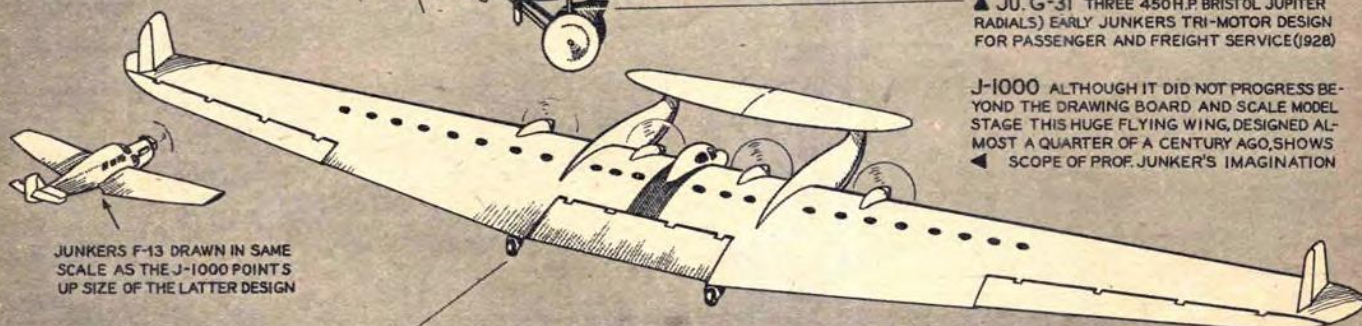
▲ JU. JUNIOR (70 H.P. SIEMENS RADIAL ENGINE). A 1924 MODEL ALL-METAL SPORT JOB



JU. K-37 TWO 450 H.P. BRISTOL JUPITER RADIALS WAS ONE OF THE FIRST MILITARY JUNKERS BUILT FOR EXPORT AFTER WORLD WAR ONE.—THIS 1928 MODEL FIGHTER-BOMBER WAS SUPPLIED TO JAPAN



▲ JU. G-31 THREE 450 H.P. BRISTOL JUPITER RADIALS) EARLY JUNKERS TRI-MOTOR DESIGN FOR PASSENGER AND FREIGHT SERVICE (1928)



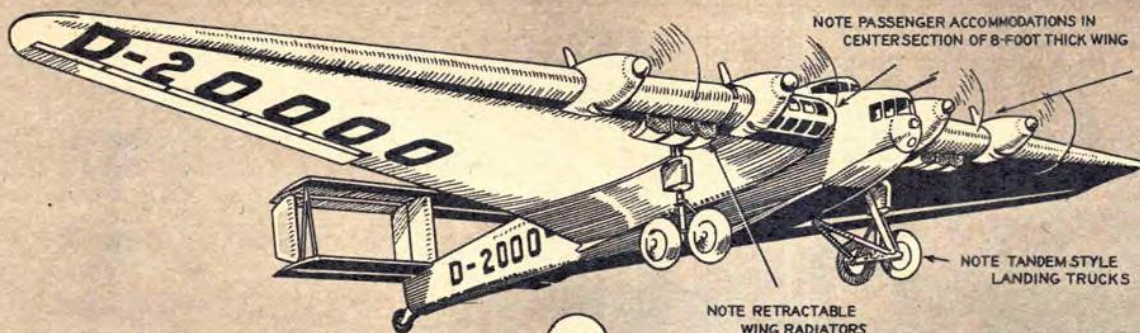
J-1000 ALTHOUGH IT DID NOT PROGRESS BEYOND THE DRAWING BOARD AND SCALE MODEL STAGE THIS HUGE FLYING WING, DESIGNED ALMOST A QUARTER OF A CENTURY AGO, SHOWS SCOPE OF PROF. JUNKER'S IMAGINATION

JUNKERS F-13 DRAWN IN SAME SCALE AS THE J-1000 POINTS UP SIZE OF THE LATTER DESIGN

Although metal airframes date from around 1910 and although attempts were made to construct all-metal planes about the same time, the real father of the genuine all-metal airplane is Hugo Junkers, a professor of thermodynamics in Aachen, Germany, at the turn of the century. A curious combination of university profes-

or and industrial engineer, he became interested in aviation in 1907 and was soon convinced that the future of the airplane lay in all-metal construction and that its function should be purely commercial. The fact his first successful designs were purely military types was due to the impact of World War I.





NOTE PASSENGER ACCOMMODATIONS IN CENTER SECTION OF 8-FOOT THICK WING

NOTE: FULLY BURIED ENGINES COULD BE SERVICED DURING NORMAL FLIGHT

NOTE TANDEM STYLE LANDING TRUCKS

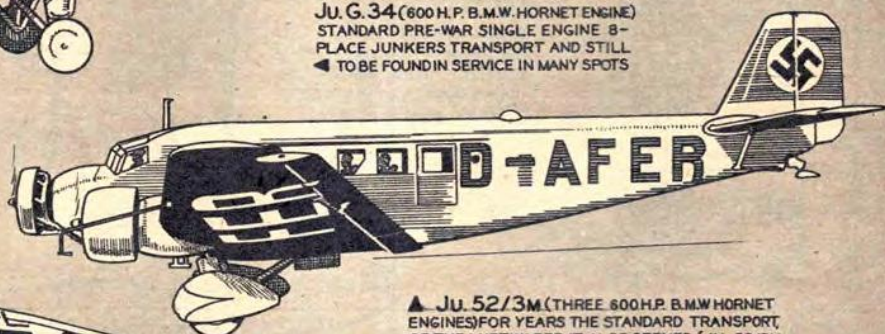
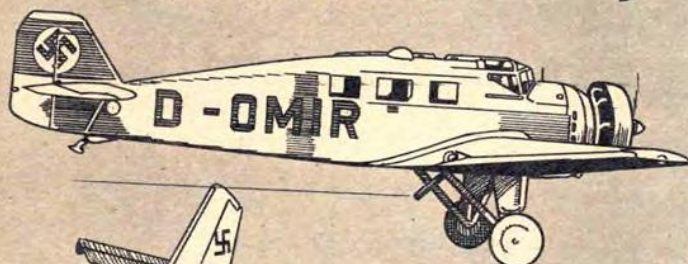
NOTE RETRACTABLE WING RADIATORS

JU. G.38 (TWO 800 H.P. & TWO 600 H.P. JUNKERS ENGINES) FIRST FLOWN IN 1929 THIS HUGE AIRLINER AND FREIGHT TRANSPORT HAD A SPAN OF 144 FT. 4 INS., WAS 75 FT. 6 INS. LONG AND WITH FULL LOAD WEIGHED 52,900 LBS. — POWER WAS LATER INCREASED TO FOUR 800 H.P. JU. L-88 ENGS.

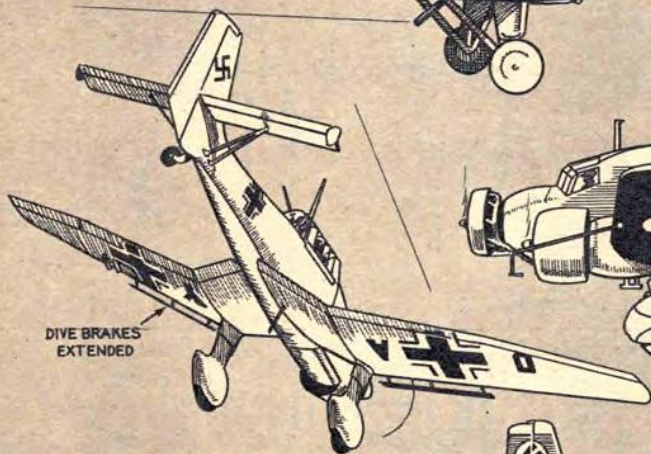


JUNKERS-JUMO 4 (720 H.P. JUMO ENGINE) WAS A 1925, G.24, JUNKERS TRI-MOTOR CONVERTED TO FLIGHT-TEST THE JU. JUMO DIESEL ENGINE — A 1929 PRODUCT

JU. G.34 (600 H.P. B.M.W. HORNET ENGINE) STANDARD PRE-WAR SINGLE ENGINE 8-PLACE JUNKERS TRANSPORT AND STILL TO BE FOUND IN SERVICE IN MANY SPOTS



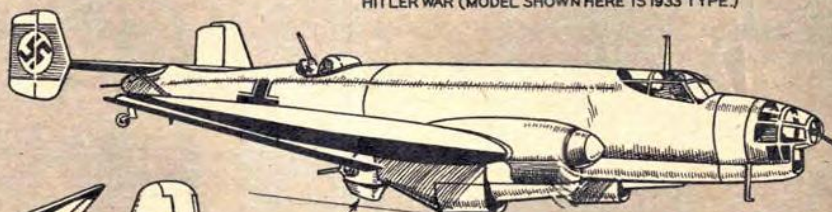
▲ JU.52/3M (THREE 600 H.P. B.M.W. HORNET ENGINES) FOR YEARS THE STANDARD TRANSPORT OF THE LUFTWAFFE, IT ALSO SERVED (JU. 52/3M K, JU. 52/3M-Z) AS GENERAL PURPOSE BOMBER, AMBULANCE AND GLIDER TUG THROUGHOUT THE HITLER WAR (MODEL SHOWN HERE IS 1933 TYPE.)



DIVE BRAKES EXTENDED

JU.87 B/R "STUKA" (1200 H.P. JUMO 211-D ENGINE) FAMED FOR ITS PART IN THE NAZI BLITZ-KRIEG DIRECTED AGAINST POLAND, FRANCE, '39-'40

JU.188 (TWO 1700 H.P. JUMO 213 ENGINES) REPLACED THE FORMIDABLE JU.88 DURING CLOSING MONTHS OF THE WAR AS NO.1 ALL-PURPOSE NAZI BOMBER



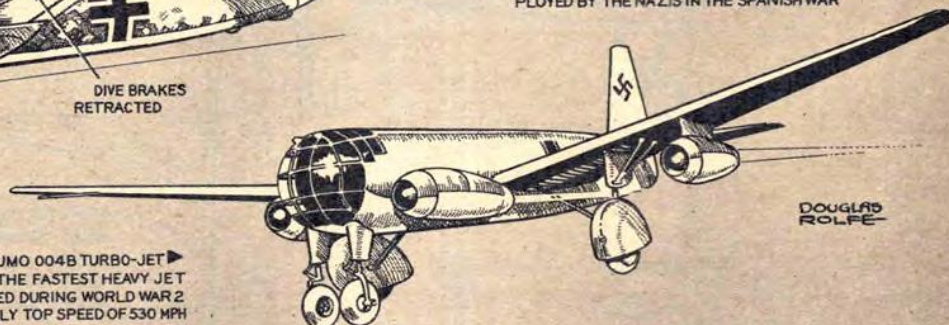
VENTRAL GUN STATION

JU.86K (TWO 700 H.P. JUMO 205 ENGINES) WAS STANDARD PRE-WAR GERMAN LUFTWAFFE HEAVY BOMBER AND WAS EMPLOYED BY THE NAZIS IN THE SPANISH WAR



DIVE BRAKES RETRACTED

JU.287 (FOUR JUMO 004B TURBO-JET ENGINES) ONE OF THE FASTEST HEAVY JET BOMBERS PRODUCED DURING WORLD WAR 2 IT HAD A REPUTEDLY TOP SPEED OF 530 MPH



DOUGLAS ROLFE

" Even then he was thwarted at every turn by the indefatigable Fokker who, foreseeing a threat to his own products, persuaded the German authorities that the impractical professor needed the guidance of a businessman like himself. Thus, Junkers' designs were consistently sabotaged in favor of Fokker's.

However, Hugo Junkers had a trick up his sleeve. Even while the war was on he had designed the J.13 (later redesignated the F.13 and still later registered as the D-1). In 1919 the F.13, world's first all-metal commercial air transport, was ready to fly, and it immediately became the outstanding airliner of its day.



JANUARY 1953 / 35 CENTS

# Air Trails



**AVRO 698**  
WORLD'S FIRST  
DELTA BOMBER

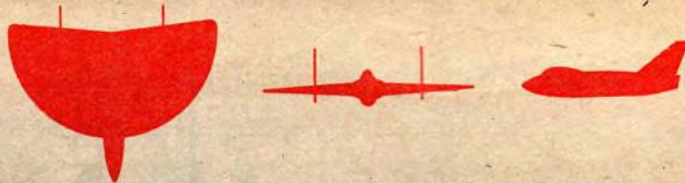
GAL SMITH

**"Sketchbook" at the Nationals • "Half-Pep" Team Racer**

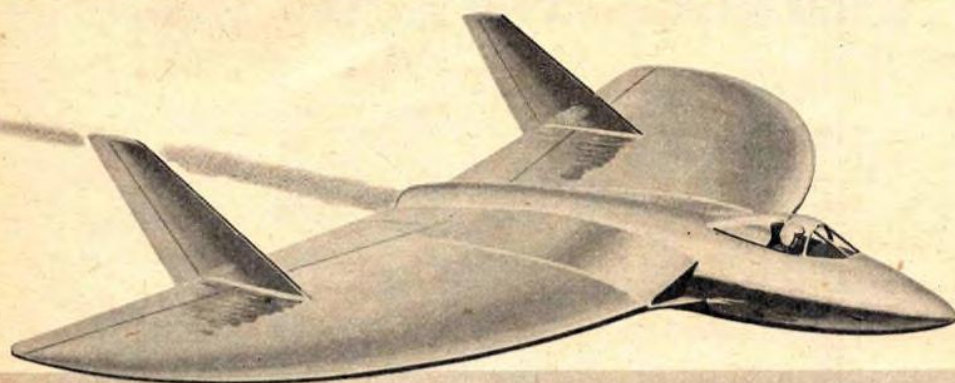


# 1<sup>ST</sup> AWARD

## Batwing, parabolic research plane

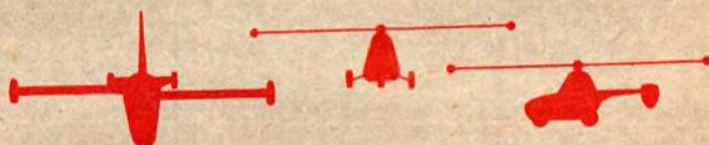


Top of the list this month is this unusual sonic research plane by Robert De Lillo of Brooklyn, N. Y. Notable is the semi-circular shape of the wing. Whether such a shape is as good or better than the delta is dubious. However, the purpose of the aircraft is to test the theory. There have been several circular wings built in the past, best known of which was the Czeranowski "Parabola." Span of Batwing is 25 ft.

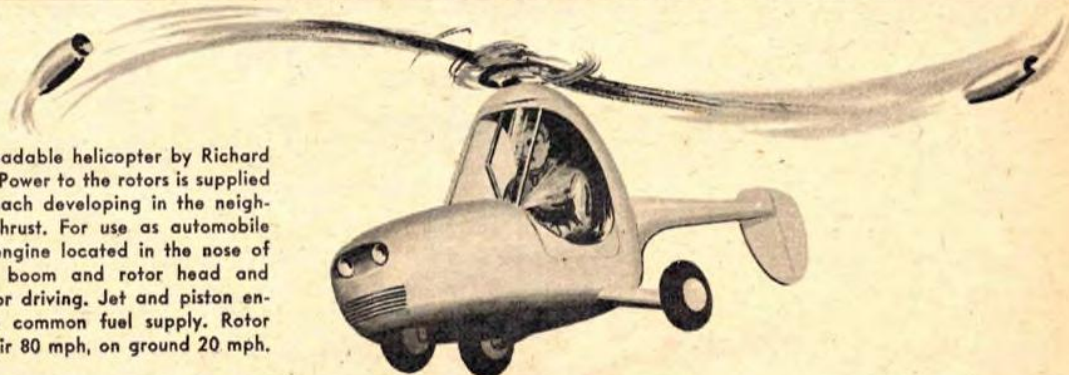


# 2<sup>ND</sup> AWARD

## Roadable ramjet helicopter

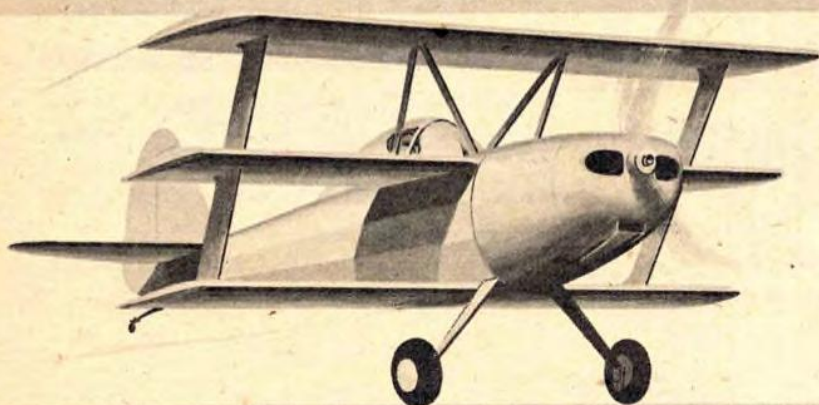


A single-place, ramjet roadable helicopter by Richard Sotelo of El Paso, Texas. Power to the rotors is supplied by two ramjets at tips each developing in the neighborhood of 50 lbs. of thrust. For use as automobile there is a small piston engine located in the nose of the fuselage. Rear tail boom and rotor head and blades are dismantled for driving. Jet and piston engines are fed from one common fuel supply. Rotor dia. is 23 ft. Speed in air 80 mph, on ground 20 mph.



# 3<sup>RD</sup> AWARD

## Sport and aerobatic triplane



Omer Blosser of Boomer, W. Va., submits the dream of all aerobatic pilots, a neat triplane. Such design is eminently suitable for stunting as short wingspan gives excellent maneuverability combined with a generous wing area. Blosser gave his tripe a wide gap between wings to minimize interference losses. The ship is very clean with its cowled-in 125 hp flat four engine and single-leg landing gear struts. Fighter type cockpit enclosure adds to pilot comfort as well as reduces drag. Top wing has span of 24 ft., mid-wing 22 ft. and lower wing 20 ft.

## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed designs may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runner-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



# The Day We Stole a MiG

■ The pilot of the Fifth Air Force reconnaissance plane swooping across the blasted landscape of North Korea spots a crashed aircraft below. He flies lower for a routine check for survivors and to identify the aircraft if possible. It seems to be an American F-86 Sabrejet with sharply swept-back wings. The nose is bashed in, there are no signs of the pilot. The pilot of the "recon" plane takes another look at the tail, high and rounded with the elevators set close to the top, and at once that battered aircraft smacked into the soil of North Korea becomes the most important piece of twisted metal in the world—at least as far as the Pentagon is concerned. For it's the first Russian MiG fighter plane that crashed with anything left to salvage, and in a place where salvage *might* be accomplished.

Radios, wires and teletypes grow hot all the way from that "recon" plane to Washington and back, and the net result is the terse directive: "Get it, at any cost, but get that MiG!"

This is at a time when the mysterious and elusive Russian MiG jet fighter, an unexpectedly effective enemy aircraft, whether flown by North Koreans, Red Chinese, or "others," has been raising havoc with the United Nations forces for many months. From USAF and other

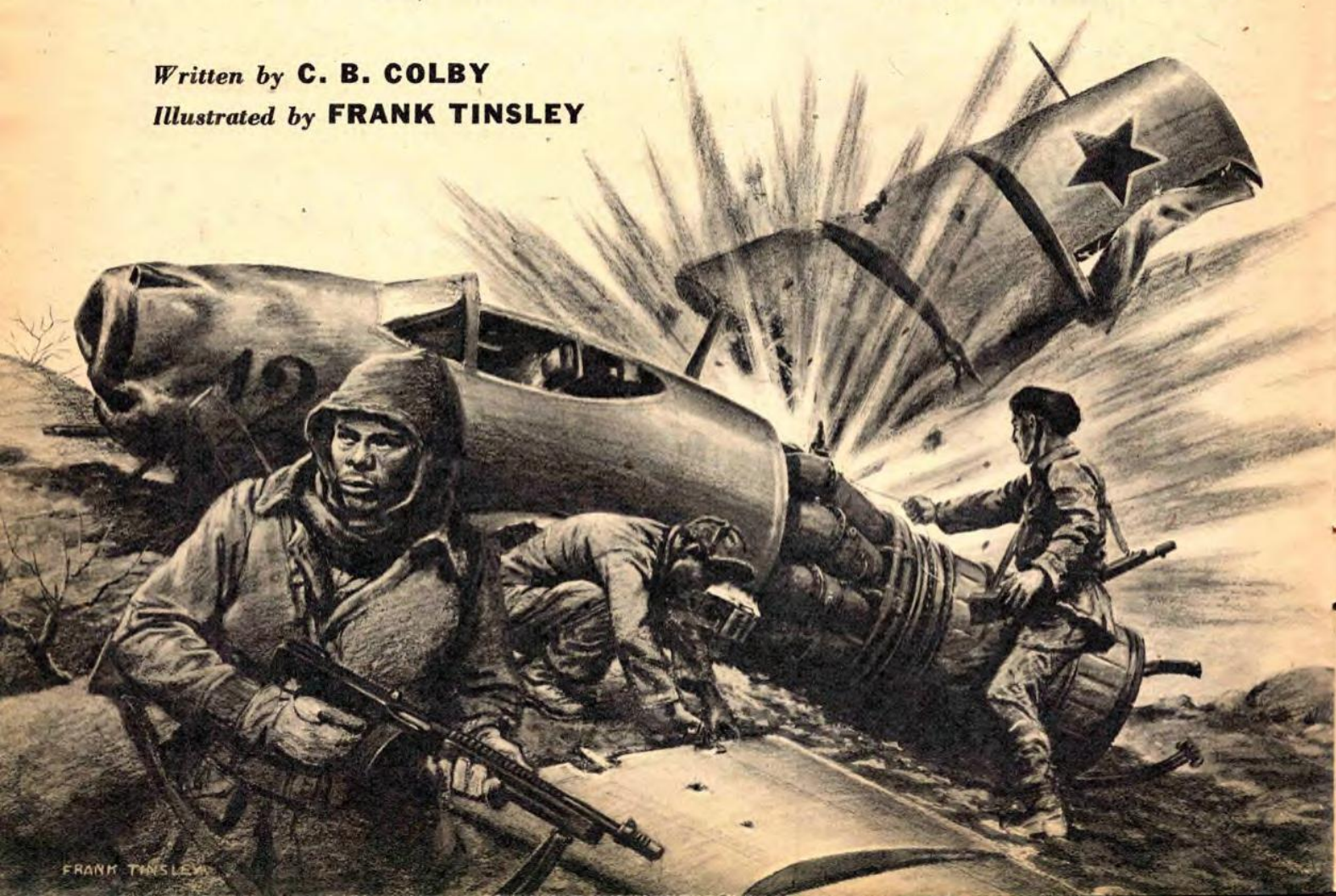
combat pilots' reports of many encounters with the MiG, our top technicians have been able to learn much about its performance and construction, but a great deal is missing of vital importance. How much of the aircraft is armored and where? What is the thrust of the engine? Where are pilot blind spots if any? And even though our fighters have an edge in encounters with the MiG, is it because of a combination of better pilot and plane—or just our pilots even though flying inferior aircraft?

There is only one item of equipment in Korea capable of bringing back that MiG. At the time it is the sole Sikorsky H-19 transport and cargo helicopter in the Korean area. This big awkward-looking affair weighs over four tons, can carry 10 passengers and crew or eight litters and one attendant and crew, or cargo. It can fly over 200 miles and back. If anything can bring back that MiG, the lone H-19 will have to do it.

General E. E. Partridge, commanding the Fifth Air Force, at once reclassifies the H-19 "expendable." Captain Joseph D. Cooper, pilot, and Captain Russell Winnegar, co-pilot of the craft, are to take help, salvage equipment and the H-19 and bring back as much of the MiG as possible. Fighter protection will be furnished, but as there will probably be only one chance at salvage

*Written by* **C. B. COLBY**

*Illustrated by* **FRANK TINSLEY**





## From deep in Red territory, USAF brings home a prize package

they may have to fly the H-19 to death with overload and excessive speed.

A few hours later, early in the afternoon of a bitter cold March day, the heavily overloaded H-19 takes off. In addition to the pilots, there are an officer of the O.S.I. (Office of Strategic Information) of the USAF and six rugged South Korean soldiers assigned to help with the salvage. Every bit of extra weight has been dumped on the runway, even down to the parachutes and other strictly emergency equipment.

From this un-named base the helicopter flies to a small island off the west coast of Korea where it stops for a last refueling and checking of equipment. It is here that Captain Cooper regretfully decides that one soldier will have to be left behind. Even so when the craft lifts its four wheels from the runway again it is still a quarter of a ton overloaded by normal measures. From this island Captain Cooper sneaks toward the mainland at low altitude, picks up a coastline check point and turns inland, climbing to 5000 feet. At about this time from scattered fields along the southern edge of the 38th Parallel rises a force of 50 jet fighter aircraft as his protection, to meet him over the target. Things are coming to a boil and fast.

At a point 35 miles behind the Communist lines the vapor trails of the fighters break from their arrow-straight paths and begin to circle their way over a tiny speck far below; the big H-19 settling into the target. As Captain Cooper jockeys his helicopter into a clearing about 100 yards from the wreck he shoots a quick glance at it. It looks practically intact with the exception of the smashed nose section and other minor damage. There are no signs of the pilot, who apparently bailed out some time before the crash or landed with it and then left the scene—they hope.

As the wheels of the helicopter settle onto the ground of the little horseshoe-shaped clearing, Captain Winnegar gives the eager soldiers the word to "go and get it!" They swarm out of the big craft with their metal cutters, wrenches, snippers and dismantling tackle, and dash for the wreck a few yards away. With them races the O.S.I. officer, to direct the salvage, and Capt. Winnegar. Joe Cooper remains at the controls of the H-19 to be ready for any emergency.

The battered MiG proves to be a tougher item than they expected. The men yank, tug, and swear, but still the Iron Curtain trophy refuses to come apart. The ten minutes allotted for the dismantling job stretch to 20. Surely the enemy must have seen the circling cover of fighters and sensed that something of vast importance was going on below them. How long before they come nosing around? In the helicopter, Cooper looks at his watch. Should he give the order to get out of there or wait a few moments longer? Suddenly he notes that the rasping and clanking of metal tools has stopped. It is strangely quiet. Have the men heard or seen something? Almost at once the silence is shattered by sharp explosions nearby. Bombs, mortar shells, or aircraft attack? The pilot prepares for instant take-off should the men come running. ("I thought the balloon had really gone up on this deal!" he reports later when telling of the noise of the explosions.)

Then the thud of running feet coming his way. It is Russ, to tell him they are using hand grenades as a last resort to get the MiG apart. Now they will really have to work fast, for the noise of the grenades will advertise their presence to the whole valley and beyond. . . . The wrecking crew heaves into view, carrying, dragging and shoving bits and sections of the MiG. They dash back for more, and when finally the last man has wormed his way into the H-19 atop the pile of MiG pieces, there is little of the Red plane left behind. It has taken 45 minutes instead of the planned ten.

Captain Cooper revs his Pratt & Whitney engine and gently engages the rotor clutch. With the additional extra weight of the MiG in its belly, the H-19 shudders and heaves—but slowly they are airborne. Now, can they get out of the clearing? "I (Continued on page 58)





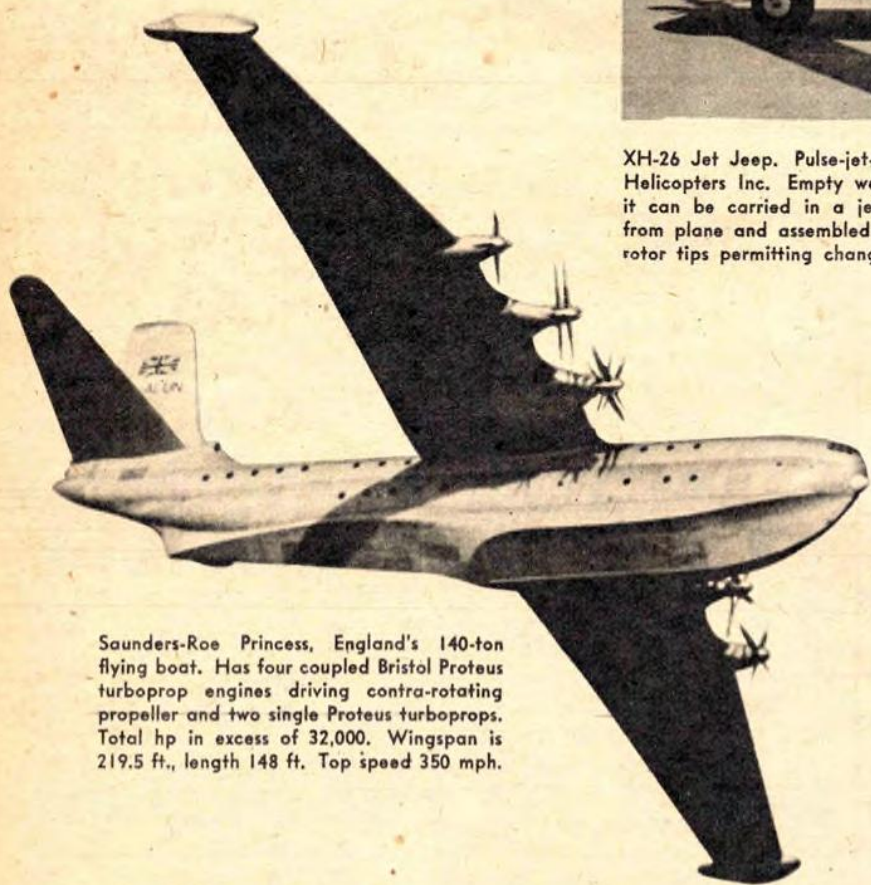
## The World A-Wing



Ryan Q-2 pilotless target drone. Silhouette drawing released by Department of Defense gives only general view of craft as it is still on secret list. However, it does reveal that power is a small turbojet engine. Size is half that of military jet fighter, comparable speed.

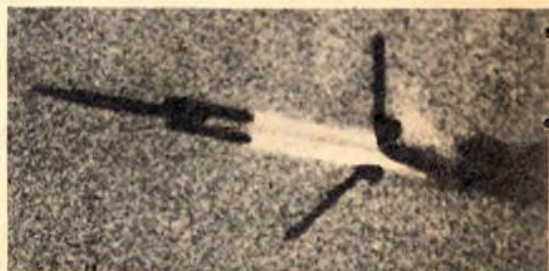


XH-26 Jet Jeep. Pulse-jet-powered helicopter built for the Army by American Helicopters Inc. Empty weight 300 lbs., but can lift twice this. Disassembled it can be carried in a jeep or packed into 5x5x14 ft. container parachuted from plane and assembled by two men in 20 minutes. Engines swivel freely at rotor tips permitting change of blade pitch without altering angle of engines.

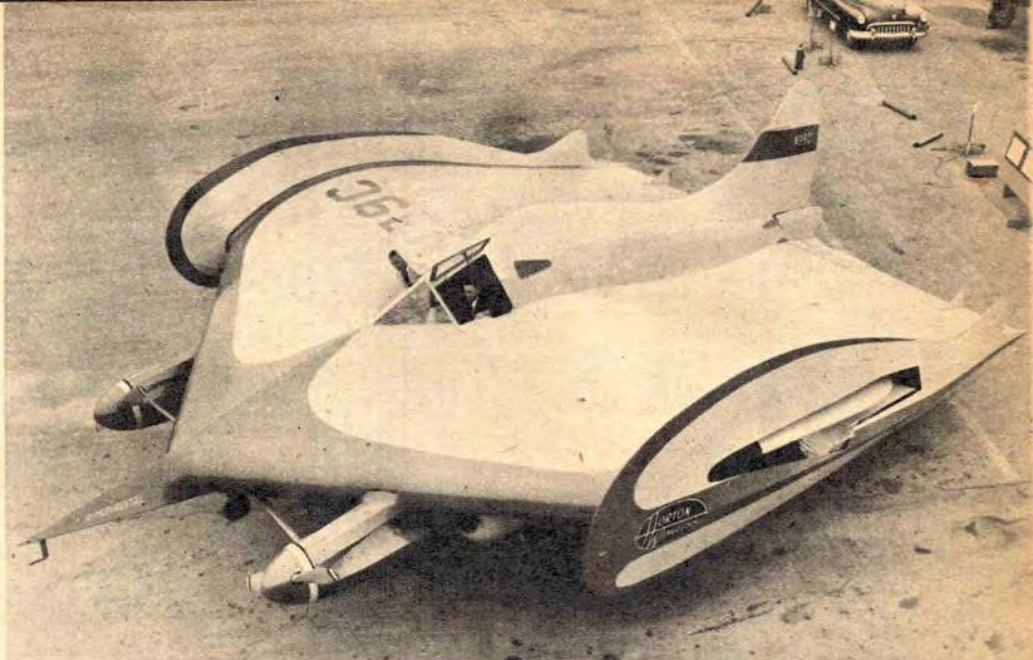


Saunders-Roe Princess, England's 140-ton flying boat. Has four coupled Bristol Proteus turboprop engines driving contra-rotating propeller and two single Proteus turboprops. Total hp in excess of 32,000. Wingspan is 219.5 ft., length 148 ft. Top speed 350 mph.

## Long Way From the Wrights







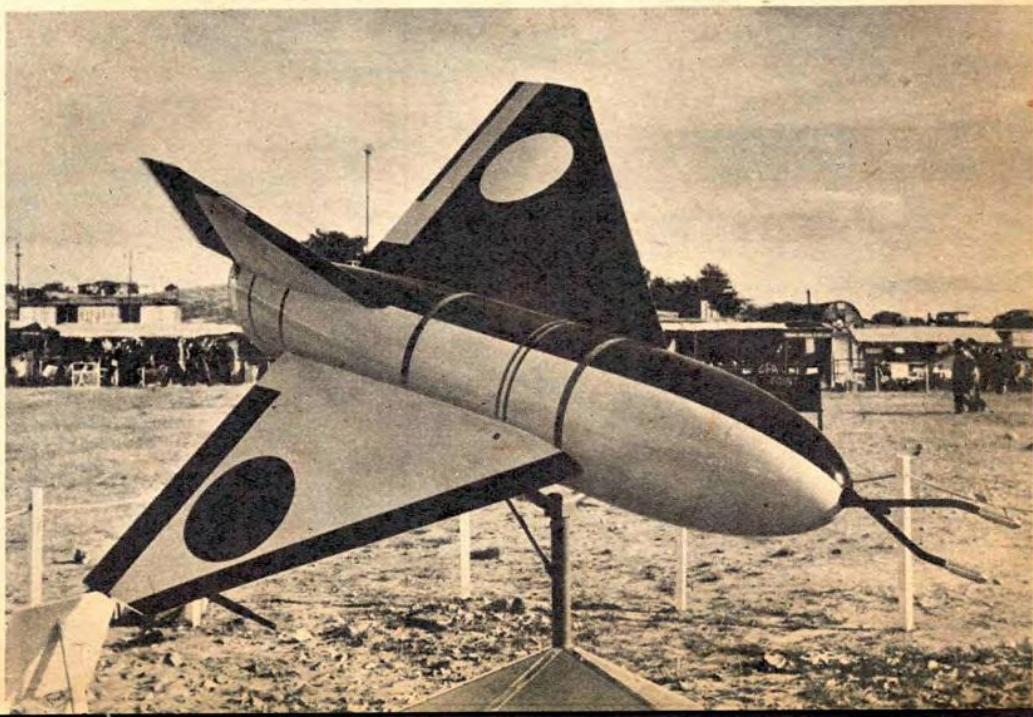
Horton Wingless plane. Second type designed by Wm. Horton of Santa Ana, Calif. Original appeared in June 1951 "AT." Recently made a test hop. Secret of performance is the tip plates which effectively keep high-pressure region from penetrating into the low-pressure one. This sealing off increases the effective aspect ratio of wing. Length 40 ft.



Left: Britain's twin-engine, twin-rotor helicopter, the Bristol 173. Powered by two Alvis Leonides engines developing 550 hp each. Presently holds 13 passengers, will carry 17 when in production. To be used on short-range air services. Rotor diameter is 48 ft. 7 in., fuselage length 78 ft. 2 in. Engines are so coupled through clutch that in event of failure either can drive both rotors. Maximum speed is 140 mph.

Right: Fairey delta guided missile, first shown at recent Farnborough show. Powered by a 2500 lb. thrust Beta II rocket motor. Has been test-flown at the Woomera test station in Australia. Although fully equipped with same type of guidance as radio-controlled missiles, it is undoubtedly slated for aerodynamic research of delta wing, as power output of rocket engine is too low for speed requirements of airborne weapons.

Left: British research guided missile developed by the Bristol Aeroplane Co., powered by ramjet engine and booster rockets. Top photo shows the missile at start of flight with rockets still attached. At center, rockets slide away as missile reaches speed of sound. Bottom, the missile is now free of rockets, flying on the power of its two ramjets. The rockets are used primarily to bring the missile up to speed at which its own engine becomes effective.

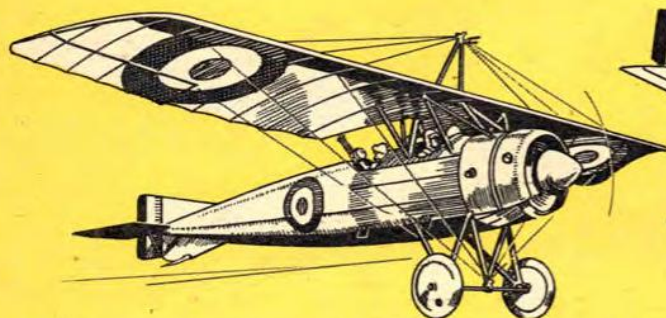




# L'Armée de l'Air Francaise: 1914-1926

By DOUGLAS ROLFE

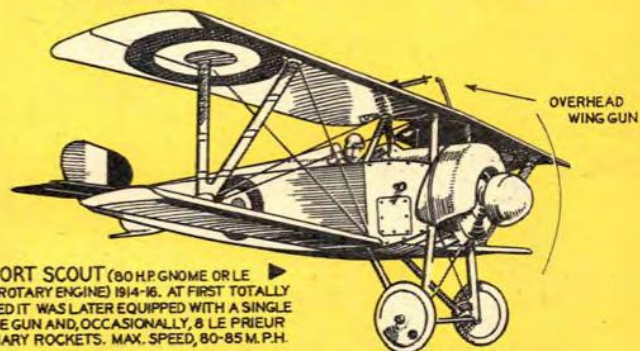
**FARMAN SHORTHORN** (70 H.P. RENAULT V-8 AIR-COOLED ENGINE). THIS 1913 DESIGN WAS USED DURING THE FIRST MONTHS OF WORLD WAR I AS A FIRST LINE AIRCRAFT BUT SERVED OUT THE REST OF THE WAR AS A PRIMARY TRAINER—FOR WHICH PURPOSE IT WAS ADMIRABLY SUITED. ▼



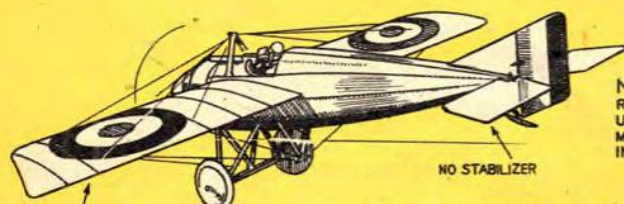
**W.W. I PURSUIT**  
(L'Avion de Chasse)

**MORANE-SAULNIER PARASOL** ▲ (110 H.P. LE RHONE ROTARY ENGINE). 1916-17. AN IMPROVED VERSION OF THE 1914 MODEL PARASOL WHICH HAD WARP-WING LATERAL CONTROL... MAX. SPEED WAS 80 M.P.H.

**W.W. I OBSERVATION**  
(Corps d'Armee)



**NIEUPORT SCOUT** (80 H.P. Gnome or Le Rhone Rotary Engine) 1914-16. AT FIRST TOTALLY UNARMED IT WAS LATER EQUIPPED WITH A SINGLE MACHINE GUN AND, OCCASIONALLY, 8 LE PRIEUR INCENDIARY ROCKETS. MAX. SPEED, 80-85 M.P.H.



NO ALERONS  
(WARP-WING  
CONTROL)

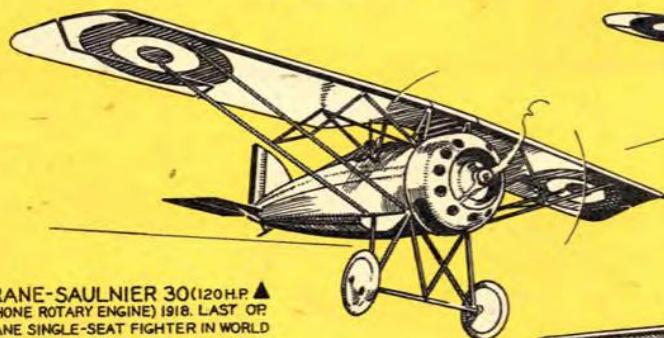
NO STABILIZER

▲ **MORANE-SAULNIER BULLET** (110 H.P. LE RHONE ROTARY ENGINE). 1915-16. FIRST AIRPLANE TO MOUNT A MACHINE GUN FIRING THRU THE PROPELLER. IT HAD A MAXIMUM SPEED OF ABOUT 90 M.P.H.



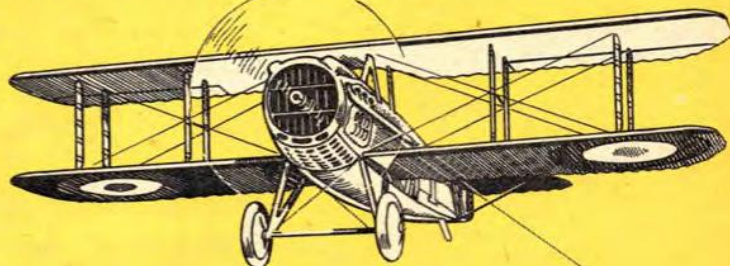
▲ **NIEUPORT 28** (160 H.P. Gnome Rotary Engine). LAST AND BEST OPERATIONAL NIEUPORT FIGHTER IN W.W. I. IT APPEARED IN LATE 1917 AND HAD A MAXIMUM SPEED OF 130 M.P.H.

**MORANE-SAULNIER 30** (120 H.P. ▲ LE RHONE ROTARY ENGINE) 1918. LAST OF MORANE SINGLE-SEAT FIGHTER IN WORLD WAR I IT WAS ALSO EMPLOYED AS AN ADVANCED TRAINER. MAXIMUM SPEED, 120 M.P.H.



\* **S.P.A.D. 7** (180 H.P. HISPANO-SUIZA V-8 ▲ L/C ENGINE). 1916-17. MAX. SPEED 127 M.P.H. A LATER MODEL, THE SPAD 13, WITH 235 H.P. ENGINE HIT 135 M.P.H. THERE WAS ALSO A CANON-SPAD—FIRST PURSUIT TO BE SO ARMED

† SOCIÉTÉ POUR LES APPAREILS DEPERDUSSIN



France was the first country in the world to adopt the air arm, and at the outbreak of World War I was the dominant air power with 1,200 trained pilots and over 1,000 serviceable planes. True, many of these planes were obsolete or at least obsolescent, but at that time nobody had the faintest idea of just what place aviation would assume in the military picture.

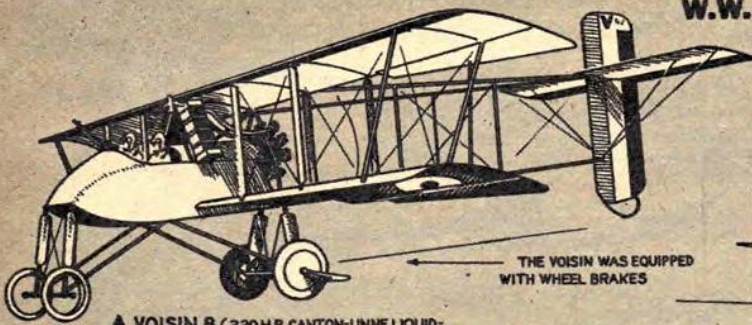
In the early days of this war armament was limited if it existed at all,

and anti-aircraft weapons were few and comparatively harmless. Thus it was possible to utilize planes with a top speed of something very much under 60 mph and ceilings of about 5,000 without much damage being done to anyone.

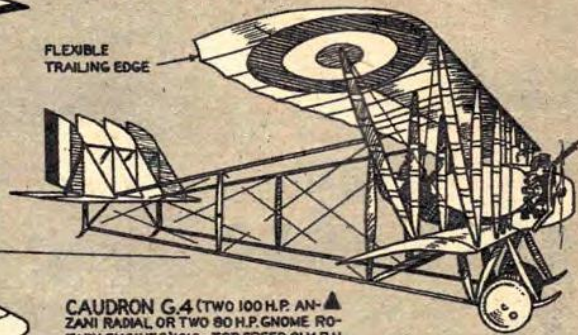
The French air arm pioneered in many features common to modern military aerial warfare. They were first to use the single-seat fighter; first to



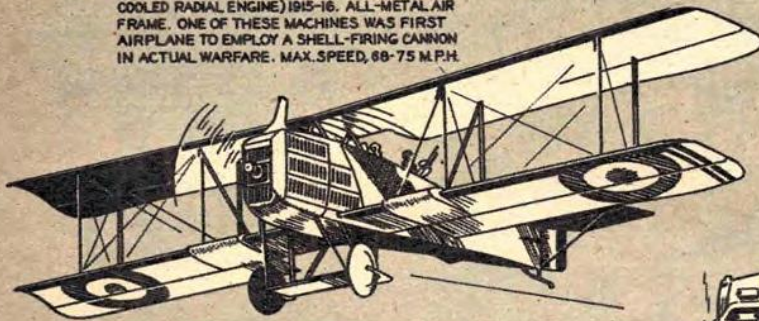
## W.W. I BOMBER-FIGHTERS (Bombardment)



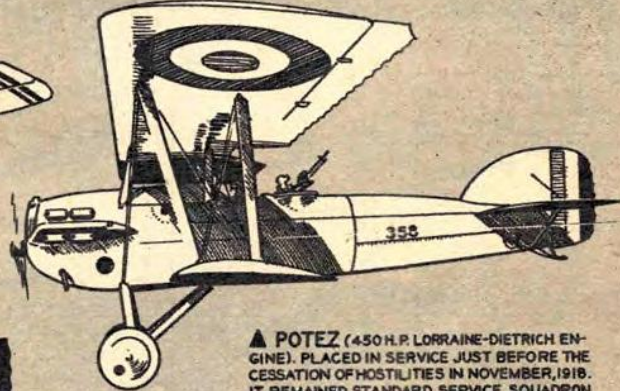
▲ VOISIN 8 (220 H.P. CANTON-UNNE LIQUID-COOLED RADIAL ENGINE) 1915-16. ALL-METAL AIR FRAME. ONE OF THESE MACHINES WAS FIRST AIRPLANE TO EMPLOY A SHELL-FIRING CANNON IN ACTUAL WARFARE. MAX. SPEED, 68-75 M.P.H.



CAUDRON G.4 (TWO 100 H.P. ANZANI RADIAL OR TWO 80 H.P. Gnome ROTARY ENGINES) 1916. TOP SPEED, 81 M.P.H.

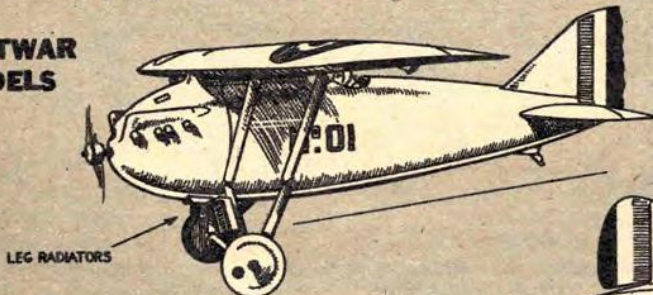


BREGUET 14 (310 H.P. L/C RENAULT ENGINE) 1918. ALL-METAL AIRFRAME AND WING FLAPS PLACED THIS AIRPLANE FAR AHEAD OF MOST CONTEMPORARY DESIGNS. — 112 M.P.H.



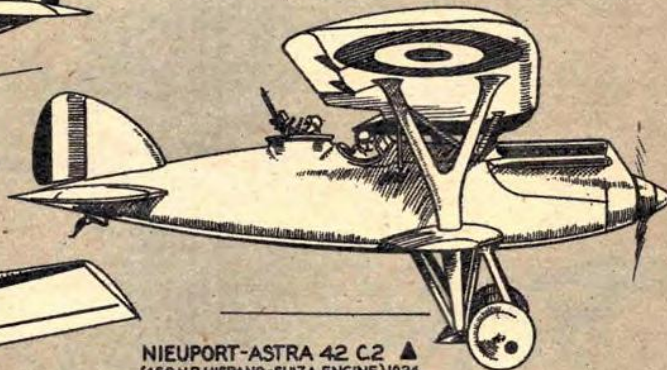
▲ POTEZ (450 H.P. LORRAINE-DIETRICH ENGINE). PLACED IN SERVICE JUST BEFORE THE CESSATION OF HOSTILITIES IN NOVEMBER, 1918. IT REMAINED STANDARD SERVICE SQUADRON EQUIPMENT LONG THEREAFTER. 120-130 M.P.H.

## POSTWAR MODELS



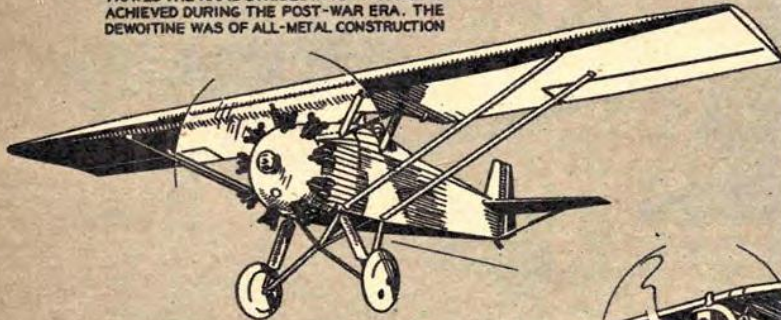
LEG RADIATORS

DEWOITINE D.1 (300 H.P. HISPANO-SUIZA ENGINE) 1924. THIS 153 M.P.H. FIGHTER ILLUSTRATES THE RAPID STRIDES IN AIR PROGRESS ACHIEVED DURING THE POST-WAR ERA. THE DEWOITINE WAS OF ALL-METAL CONSTRUCTION

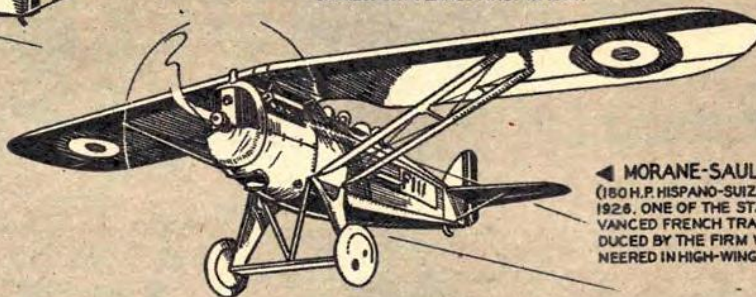


NIEUPORT-ASTRA 42 C.2 ▲ (450 H.P. HISPANO-SUIZA ENGINE) 1924. ANOTHER EXAMPLE OF EARLY POST-WAR DESIGN. THERE EXISTED ALSO A SINGLE-SEAT VERSION OF THIS AIRPLANE. THE CHARACTERISTIC RUDIMENTARY LOWER WING APPEARED ON NIEUPORT PLANES FIRST IN 1914.

DOUGLAS HOLBE



WIBAULT 7 (450 H.P. BRISTOL JUPITER RADIAL ENGINE) 1926. THIS ALL-METAL SINGLE-SEAT FIGHTER WAS PRECURSOR OF A LONG SERIES OF WIBAULT MILITARY PLANES



▲ MORANE-SAULNIER 129 (180 H.P. HISPANO-SUIZA ENGINE) 1926. ONE OF THE STANDARD ADVANCED FRENCH TRAINERS PRODUCED BY THE FIRM WHICH PIONEERED IN HIGH-WING AIRPLANES

employ electrically fired rockets and first to mount cannon on both multi- and single-place fighters. Despite a somewhat romantic approach to the business of aerial warfare and an incredibly sloppy ground maintenance, the French Air Corps consistently turned out pilots and airmen of great bravery and skill. Garros, Pegoud, Guynemer and Fonck are names which will long be recalled in talk of the relative merits of fighter pilots.

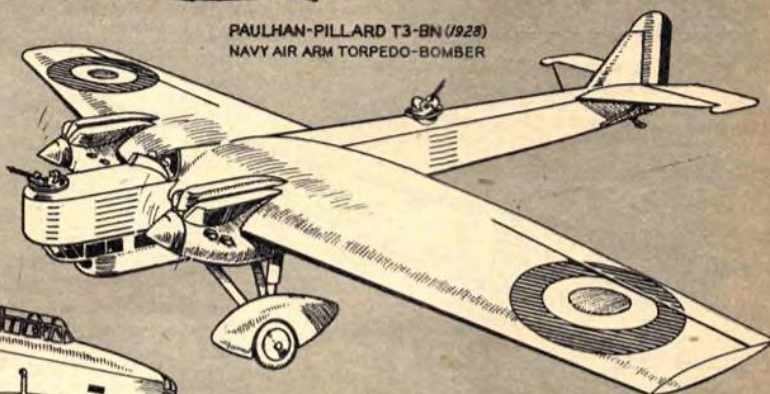
From the point of actual air progress the planes illustrated here have many interesting angles. The ones on these two pages represent only a very few of the numerous types France employed during the first World War. On the following two pages we cover the second period of the French Air Corps ending with the brief and disastrous part it played in World War II.



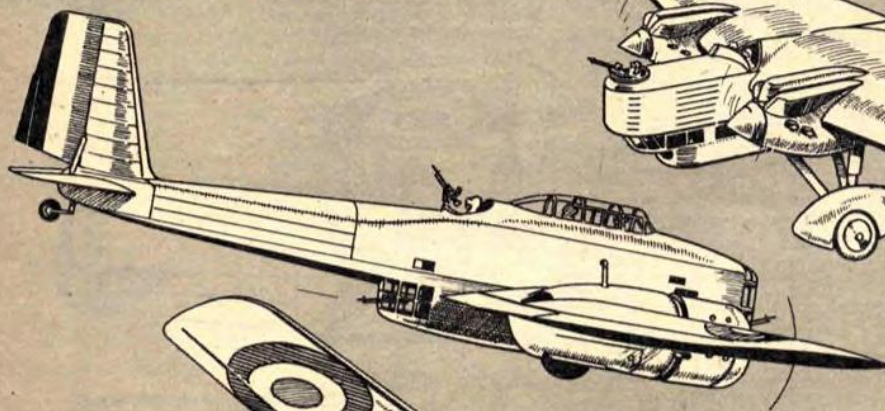
# L'Armée de l'Air Française 1926-1940



PAULHAN-PILLARD T3-BN (1928)  
NAVY AIR ARM TORPEDO-BOMBER

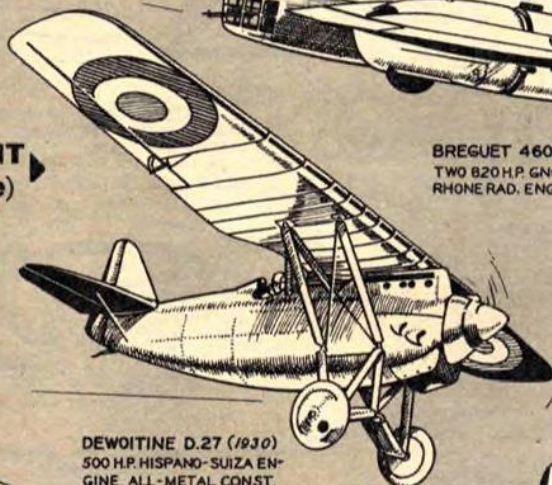


AMIOT S.E.C.M. 140M. (1928)  
TWO 700 H.P. LORRAINE ORION  
ENGINES. ALL-METAL CONST.

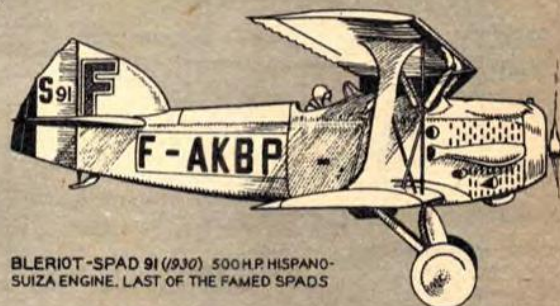


BREGUET 460 (1935)  
TWO 820 H.P. Gnome-  
Rhône RAD. ENGINES

**PURSUIT**  
(Chasse)



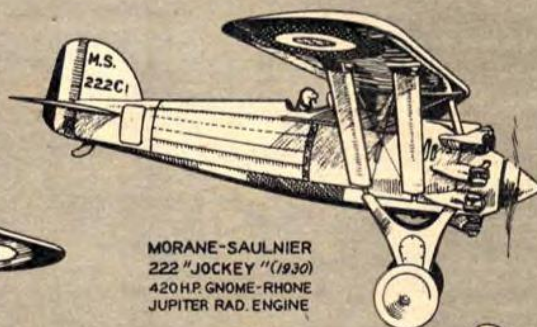
DEWOITINE D.27 (1930)  
500 H.P. HISPANO-SUIZA EN-  
GINE. ALL-METAL CONST.



BLERIOT-SPAD 91 (1930) 500 H.P. HISPANO-  
SUIZA ENGINE. LAST OF THE FAMED SPADS



NIEUPORT-DELAGE 82 C.1 (1930)  
500 H.P. LORRAINE PETREL ENGINE



MORANE-SAULNIER  
222 "JOCKEY" (1930)  
420 H.P. Gnome-Rhône  
JUPITER RAD. ENGINE



HANRIOT (1936) TWO 450 H.P. INVERTED AIR-COOLED  
RENAULT V-12 ENGINES. AN EARLY APPROACH TO A  
FAMILIAR WORLD WAR 2 TYPE. NOTE TOO-SMALL TAIL

For some years after World War I the French maintained a formidable air arm equipped with some of the best military aircraft in the world. At this period French design was quite advanced. In fact, at a time when we were still largely dependent on fabric-covered military planes the French were producing all-metal types of very interesting and often advanced design.

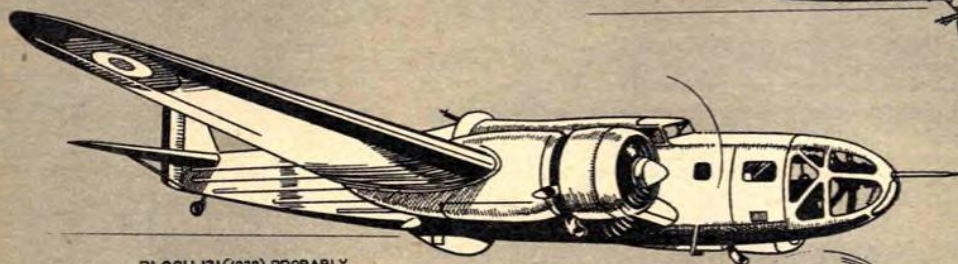
As World War II loomed closer and closer the situation was less favorable.

The French were burdened with a preponderance of prototype designs and heavily involved in labor troubles within the aircraft industry, so that when the war actually broke out in 1939 they found themselves with more than the usual number of outdated aircraft in their first-line squadrons.

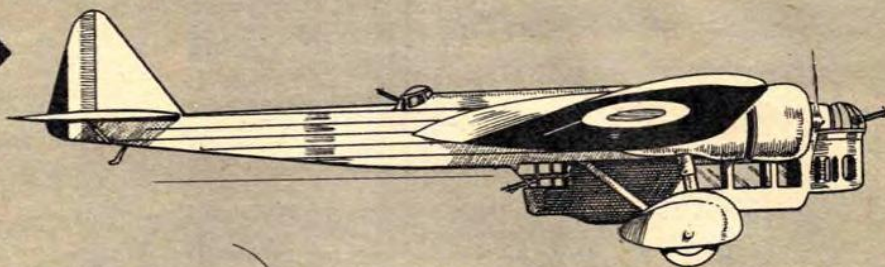
Lacking any fighters comparable to the Hurricane and the Spitfire with which the British managed later to blunt the overwhelming numerical superiority of the Luftwaffe, the French air arm was rapidly reduced to a state



## MEDIUM & HEAVY BOMBERS (Bombardment)



BLOCH 131 (1938) PROBABLY AS GOOD AS MOST CONTEMPORARY TYPES IN ITS CLASS, REGARDLESS OF NATION, AT OUTSET OF THE HITLER WAR



AMIOT 143M (1936) A REFINED VERSION OF THE 1929 TYPE 140M IT WAS STILL IN SERVICE WHEN THE NAZIS OVERRAN POLAND AND PRECIPITATED WORLD WAR NO. 2 (ALTHOUGH COMPLETELY DATED)



AMIOT 370 (1939) TWO 860 H.P. HISPANO-SUIZA ENGINES. WITH A CLAIMED TOP SPEED OF 311 M.P.H. THIS WAS ONE OF THE BEST FRENCH TYPES IN SERVICE IN 1939



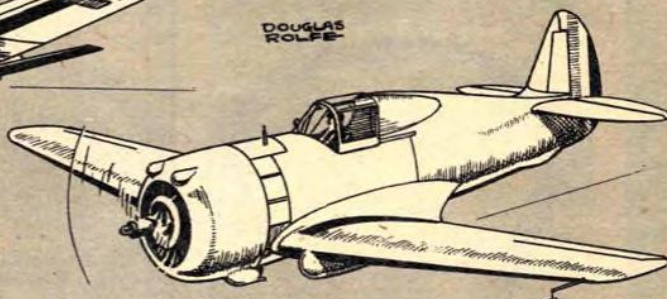
DEWOITINE 510 ALREADY OBSOLETE IN 1939 IT WAS STILL IN SERVICE WHEN THE NAZIS INVADDED FRANCE IN 1940



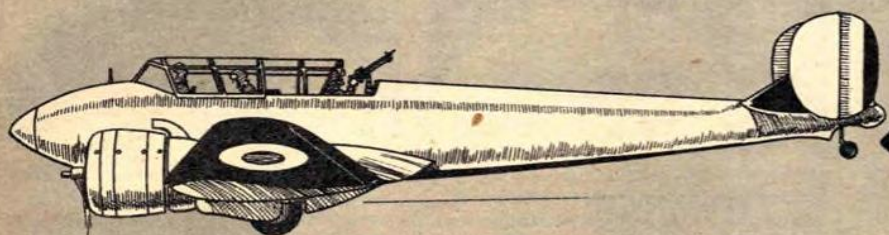
BLOCH 151 (1939) ONE OF THE MORE UP-TO-DATE TYPES WITH WHICH SOME FRENCH FIGHTER SQUADRONS WERE EQUIPPED BEFORE THE COLLAPSE OF FRANCE



MORANE-SAULNIER 406 (1939) ANOTHER EXAMPLE OF THE BETTER TYPE EQUIPMENT FOUND IN SERVICE BEFORE DEFEAT OF FRANCE  
POTEZ 63 (1938) WITH A CLAIMED MAXIMUM SPEED OF 295 M.P.H. THIS 3-PLACE FIGHTER-BOMBER WAS ONE OF THE BEST IN ITS DAY



DOUGLAS ROLFE



CURTISS HAWK 75 A (1940) U.S. BUILT, IT WAS SUPPLIED TO FRENCH SERVICE SQUADRONS AFTER THE WAR STARTED

## FIGHTER-BOMBERS (Multi-place léger de défense)

of impotency. Worse still, in the tragic 40 days which ended in the fall of France the Nazis were able to, and did attack the major French air bases far behind the battle line. After a brief aerial bombardment paratroops shot up the bewildered field personnel, and then the more serviceable French aircraft were flown away by German pilots brought in by air for this special purpose, while the captured French pilots were taken off to captivity in Luftwaffe transports.

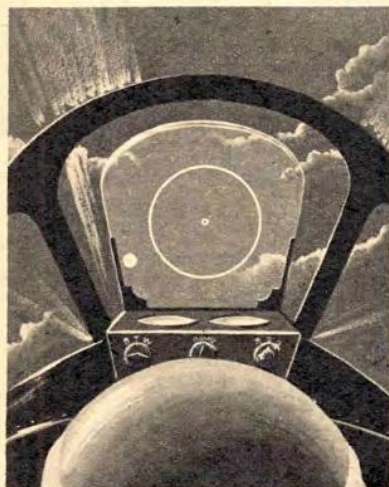
In these dire straits the French made a futile appeal to the British for more fighter squadrons. The British, seeing the imminent fall of France, wisely refrained from committing their reserve fighter command to what was indeed a hopeless cause.

During World War II the French received from the U. S. a number of Curtiss Hawk 75A's (export version of the P-36), Vought SB2U Chesapeake, Douglas DB-7's and Martin Maryland twin-engine bombers.

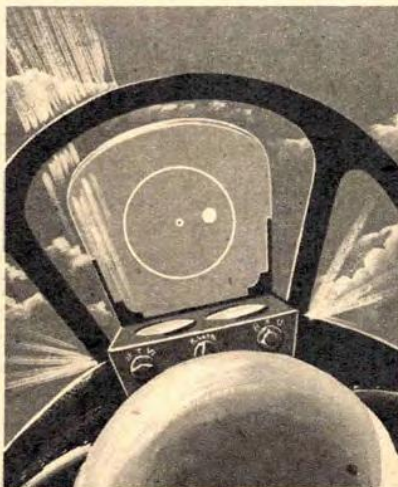


An electronic brain reacting with  
the speed of light helps to destroy  
the enemy in aerial combat  
fought at the speed of sound

# NO TIME



These three sketches furnish a graphic pilot's-eye view of A-1 sight in action. Radar image of target is low and to the left. Pilot must line up fighter in order to center radar pip in gunsight reticle. Radar measures enemy's distance, your range. Range circuit "locks onto" target, and servo supplies this range data to sight's computer.



As fighter banks to the left in a diving turn to center image, two gyros tilt a mirror device in the sight head. When pilot corrects for mirror tilt by turning to center radar pip, computer automatically supplies proper deflection lead. Note how pip glows brighter as plane comes within shooting range at about 2000 yds.



Pilot goes into a gentle right turn to correct for target's evasive action. Pip is now centered. Plane is in range and on target. Bull's-eye! (Note switches on the sight head: Left reads BTW, means Bomb-Target-Wind scale. Center is weapons selector switch, changes sight's function, from m.g.'s & rockets to bombs. Right, RSU: rocket setting unit.)



# TO KILL!

By JAMES L. H. PECK

■ "If any one factor accounts for our combat score against the MiG-15, it is the radar gunsight," said an FEAF armament officer, recently. And a pilot from the 27th Fighter-Escort Wing—the first operational unit to use the A-1 sight in combat—was equally emphatic: "Our outfit and other fighter-bomber units have been making some remarkable hits with rockets and bombs as well as our gun armament. The sight has more to do with this than any single factor, including skill or luck."

In aerial combat that borders on the supersonic, Sabre and Thunderjet pilots have to be as quick on the draw as a Western gunfighter. At the other extreme down below, the fighter-bomber boys who work over Red ground targets at tree-top altitude cannot invite flak hits by hesitating to figure out windage, drift, slant range and other bombing or rocketry "kinematics."

This amazing electronic computing sight solves all such problems for the jet men who haven't time to kill. The A-1 sight does practically everything but fly the airplane. It accomplishes even that, in the newest A-1C version, through a hook-up with the fighter's autopilot. In normal use with the present model, however, all the pilot need do is center target image in his sight, fire.

Airmen are getting hits at fantastic ranges. They've scored hits and even a few kills over Korea at 2,000 yards—about one and one-eighth miles. The maximum range of most World War II kills was 650 yards; and the

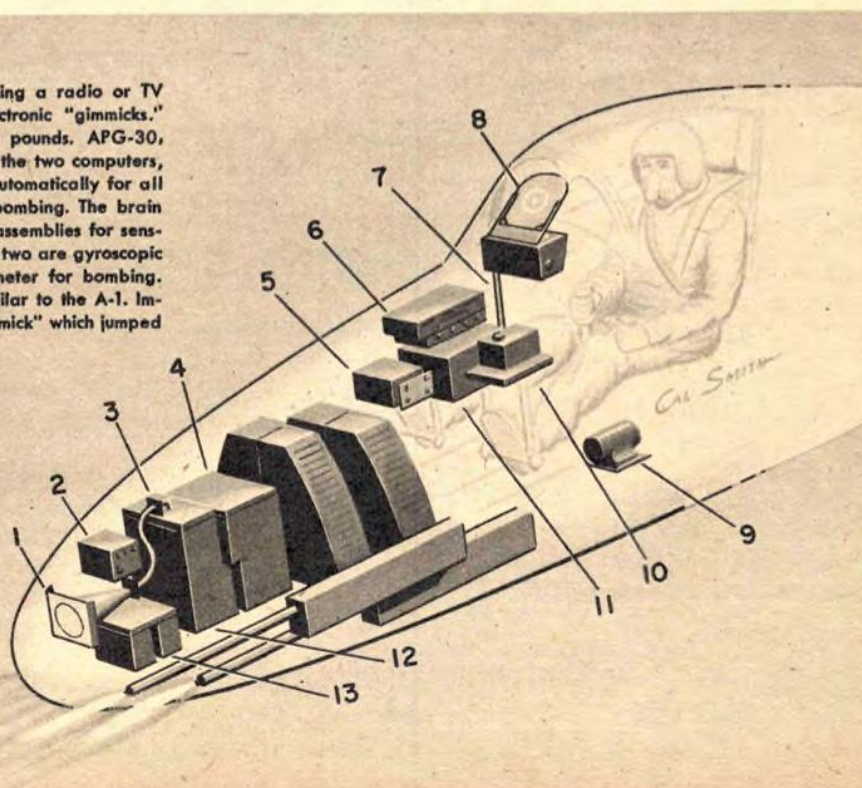
boys are now flying almost twice as fast as they did against the Luftwaffe and Jap Air Force. Moreover, by detecting enemy aircraft at night, under daytime conditions of poor visibility, or at extreme ranges beyond human vision even when the sky is clear, the A-1 and J-1 sighting system provide the single-seater fighter with the all-weather capabilities of the slower, more costly two-seater night fighter.

The basic design of the radar sight is credited to Dr. Charles S. Draper, head of M.I.T.'s department of aeronautical engineering, and probably the world's leading designer of automatic angular tracking devices. Production of the sight—with its all-important APG-30 radar—was turned over to the Sperry Gyroscope Company. The Republic Thunderjet was selected for the first service-test trials, and the F-84E-25 series was the first production-line aircraft to be fitted with the sight.

A sufficient number of Thunderjets and Sabres have been lost, meanwhile, through operational accidents or combat to make it almost a certainty that both radar sights have been thoroughly compromised. The Reds are presumed to have salvaged enough of the pieces from enough different airplanes to have gained a working knowledge of the equipment. But one officer commented, "It will still take them more than two years to build a duplicate that will work, notwithstanding the fact the Reds already have a fairly good radar sight."

The A-1 consists of eight boxes, each resembling a radio or TV chassis, plus horn antenna and two smaller electronic "gimmicks." The complete unit weighs approximately 80 pounds. APG-30, radar ranging gear, is used as seeing eye for the two computers, 4 and 11. These electronic brains compensate automatically for all the ballistic factors in gunnery, rocketry and bombing. The brain consists of three separate, but interconnected, assemblies for sensing deflection, elevation, and G forces. The first two are gyroscopic devices, the third is a gravity drop accelerometer for bombing. The J-1 system used by Sabres in Korea is similar to the A-1. Improved J-1 may be the widely publicized "Gimmick" which jumped Sabre-MiG "kill ratio" from 7 to 1 to 15 to 1.

1. Horn antenna. 2. Voltage regulator. 3. Waveguide assembly. 4. Range computer, power supply. 5. Static converter. 6. Amplifier. 7. BTW (Bomb-Target-Wind) drive chain. 8. Sight head. 9. Sight inverter. 10. Range servo mechanical unit. 11. Computer. 12. Radar T-R unit (Target-Range). 13. Range servo.





FEBRUARY 1953/35 CENTS

# Air Trails



FRENCH JET: Fouga "Magister"



DUTCH JET: Fokker S-14 trainer



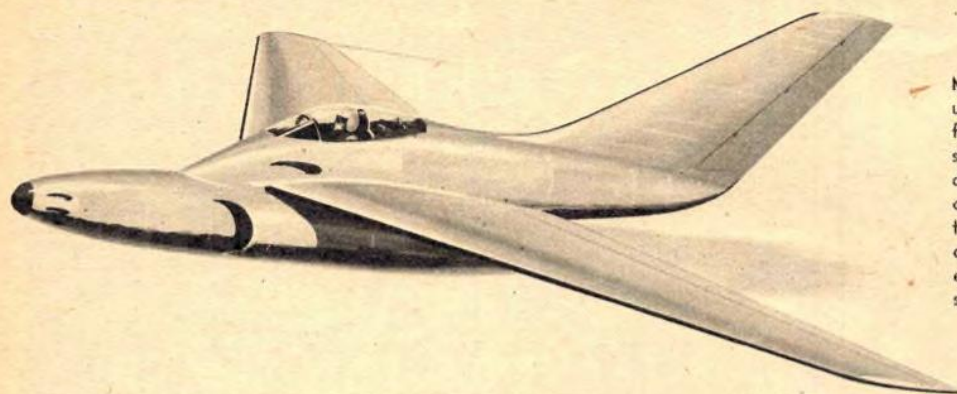
ITALIAN JET: Caproni F-5 "lightplane"

CAL SMITH

"Amazon" Free Flight—Thomas Sketches Top Radio Models

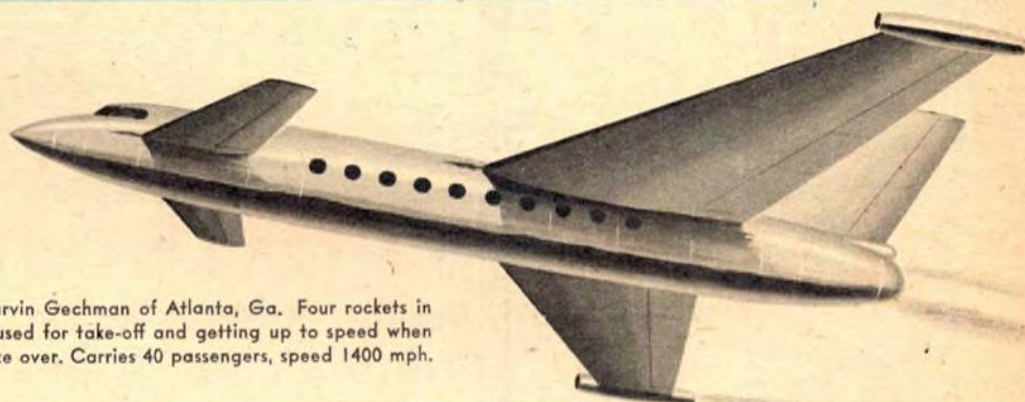


# 1<sup>ST</sup> AWARD Variable sweep wing jet interceptor



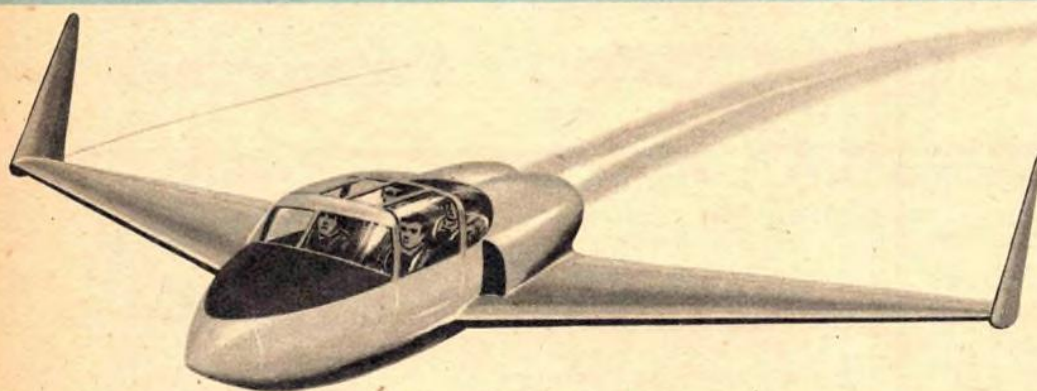
Manuel Romero of Lake Worth, Fla., comes up with an interesting jet interceptor design featuring a variable sweep wing. In normal state wing is swept back approximately 30 deg. and the angle can be increased to around 45 deg., permitting the interceptor to reach speeds of Mach 1.5. Powerplant is a 9500 lb. thrust turbojet. Two rocket launchers in the nose can fire a total of 48 rockets, supplemented by six cal. .50 or .60 m.g.s.

# 2<sup>ND</sup> AWARD Ram-jet and rocket transport



Canard type airliner by Marvin Gechman of Atlanta, Ga. Four rockets in aft section of fuselage are used for take-off and getting up to speed when wingtip-mounted ramjets take over. Carries 40 passengers, speed 1400 mph.

# 3<sup>RD</sup> AWARD Light commercial transport



A five to six passenger light jet transport by A/lc David E. Fetherston of Lowry AFB, Colorado. Engines develop 1000 lbs. of thrust each. Plane can fly on either. Top speed with both is estimated at 500 mph, 300 mph on one. Cabin is sealed and pressurized. Solenoid lock prevents opening door when engines are running. Span 35 ft.

## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



# TU-faced Reds

By WILLIAM GREEN

**Little-known facts about two Russian bombers that pose a real threat; design refinements show Reds constantly improve aircraft**

■ Throughout World War II main Russian productive effort was centered on vast manufacture of strictly orthodox aviation equipment. Airplane types were simple and adaptable for a wide variety of roles, accent being placed on rapid availability and production simplicity rather than fullest fighting efficiency. Combat machines were reduced to a few *all-rounder* types, but by the end of the war the Soviet air staff realized that a higher degree of specialization had to be accepted, how-

ever unpalatable, if qualitative parity with the West was to be achieved.

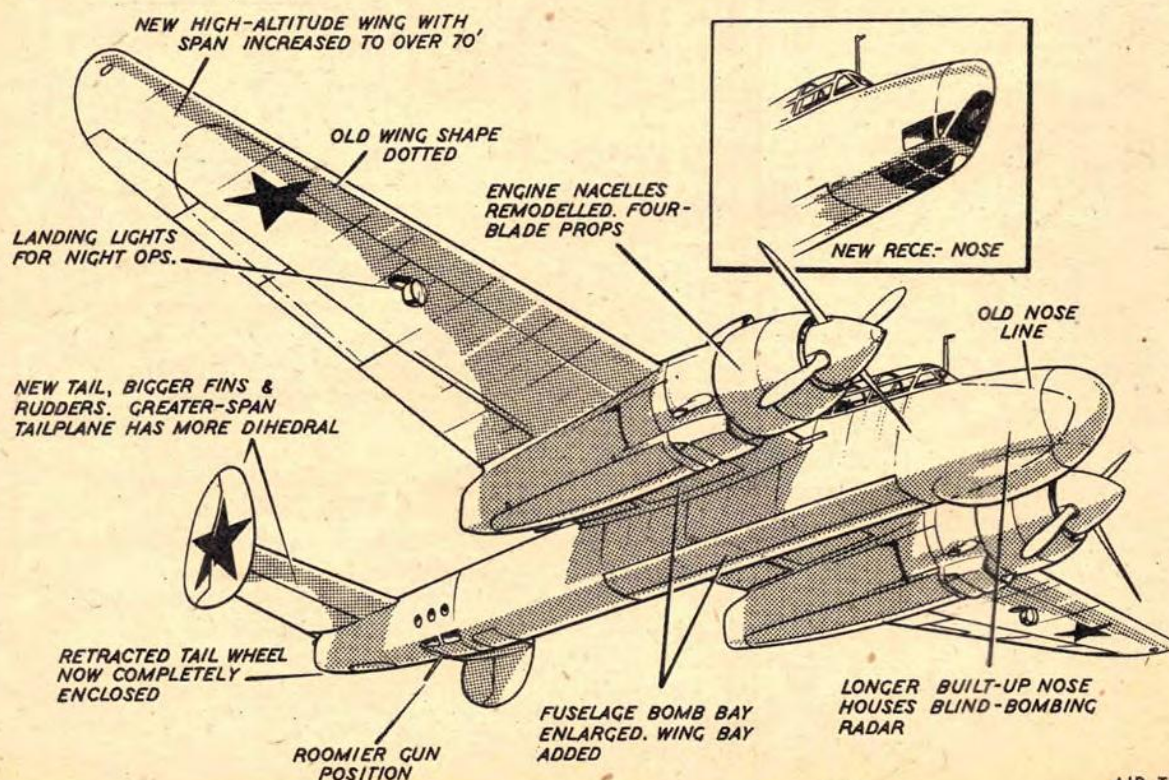
Prime importance was given in the immediate postwar years to the evolution of specialized single-seat day interceptor and multiseat all-weather interceptor fighters, with specialized attack airplanes taking second place on the priority list. As an interim measure, a policy of modification and improvement on late-war-time designs was adopted to suit the machines to fill specialist roles.

Hitherto, little has been revealed of this interim development program, but the disclosure on these pages of specialized models of the highly-successful Tu-2 general-purpose light bomber offers further evidence of the stress placed by the Soviet air staff on the importance of attaining the exacting technical standards set by the USAF with the least possible delay.

Designed by Lieutenant-General Andrei N. Tupolev during the war years, the Tu-2 is still considered to be very much *first-line* equipment by the air arms of Russia, Poland and China, and although replaced in Europe by the twin-jet Ilyushin Il-28, it remains the



**Tu-6, high altitude pathfinder and recon. bomber.**





standard equipment of light bomber regiments of the Soviet Asiatic air divisions.

Tupolev's sole wartime design to enter service and for which he received a Stalin Prize in 1943, the Tu-2 began to appear during the final campaigns on the Eastern Front during 1944-45, when it was used to precede waves of assault aircraft in the "softening-up" operations. Initially powered by two 1,640 hp ASH-82F fourteen-cylinder radials, the Tu-2 rapidly proved to be a good weapon by wartime standards and, by Russian standards, one of their best equipped.

Quality manufacture of the Tu-2 continued during the immediate postwar years, this airplane remaining exclusively Russian until late 1950 when a number were supplied to Polish squadrons. That it has since been supplied to the Sino-Communist air arm was evidenced earlier last year by the abortive attempts made with this airplane to attack U.N.O. positions in Korea.

The Tu-2 has come in for much progressive modification during its service life; late production models were powered by the 1,850 hp ASH-82FNV radials, four-blader airscrews replacing the three-bladers used by initial production models, and the top speed was boosted to 357 mph at 19,000 feet. A specialized ground-assault model was developed to carry a 40-47-mm caliber gun offset to port in a shortened, blunt nose. The cockpit of this model was somewhat redesigned and the nacelles were extended to compensate for the shorter nose.

In addition to the large caliber gun, this version of the Tu-2 carried two 20-mm guns in the wing roots and five 12.7-mm Beresin guns in dorsal and ventral positions. The standard fuselage bomb-bay carried 3,300 pounds of bombs and, over shorter ranges, extra wing bays could accommodate an additional weight of 1,700

pounds of anti-personnel bombs. These wing bays could be supplanted by rockets mounted between the engine nacelles and the fuselage sides.

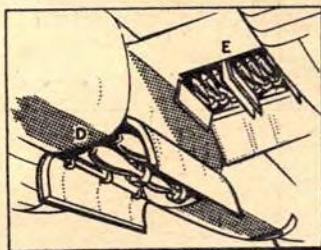
Final production models of the standard Tu-2 had their wing span increased from 61 to 62 feet, larger end-plate fin and rudder assemblies, increased dihedral on the tailplane and a fully retractable tailwheel, but so extensive was the redesign work involved in the next variation on the Tu-2 theme—a high-altitude pathfinder recon bomber—that this model became the Tu-6.

The Tu-6 has been seen in two versions; a straight-forward high-altitude reconnaissance bomber with a redesigned nose of more angular appearance than that of its predecessor, and a lead-ship version with a built-up nose, bulging below the fuselage under-line, housing blind bombing radar. The wing of the Tu-6 spans over 70 feet (as compared with 62 feet of the late-production Tu-2), has negligible taper on the leading edge and broad, rounded tips; the engine nacelles have been cleaned-up; the fuselage bomb-bay enlarged and the span of the tailplane increased.

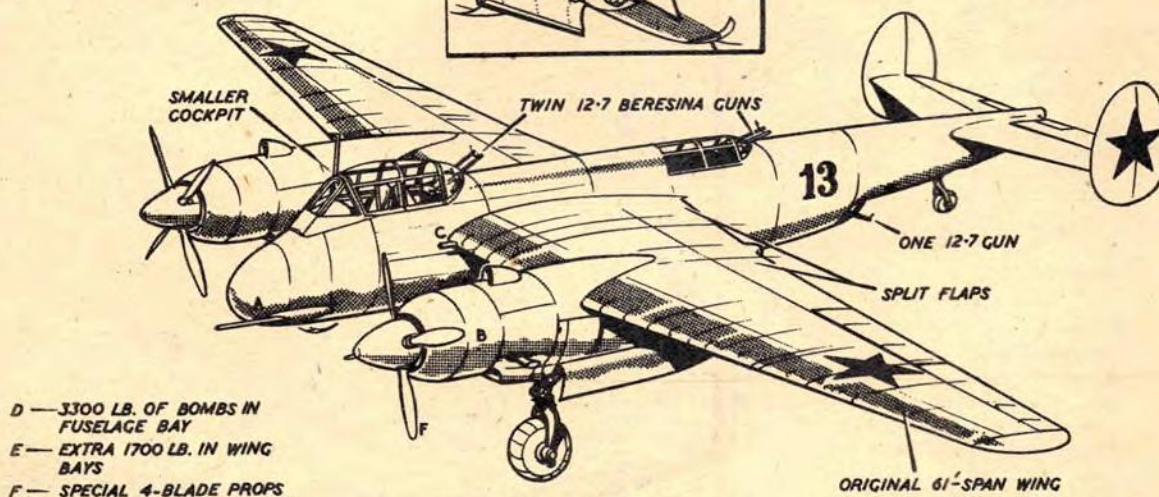


Ground assault version of the Tu-2 tactical bomber.

- A—HEAVY CALIBRE GUN IN SHORT NOSE. ROOM FOR OTHER ARMAMENT
- B—EXTENDED ENGINE NACELLES COMPENSATE FOR SHORTER NOSE. TWO ASH-82 FNV RADIALS 1850-H.P.
- C—TWO 20-MM CANNON IN WING ROOTS



MAX. SPEED 345 MPH  
AT 19,000'  
CLIMB TO 18,000' IN  
9.5 MIN.  
SERVICE CEILING  
28,000'  
NORMAL LOADED WT.  
25,000 LB  
NORMAL-LOAD RANGE  
1100 MILES





# Planes Go Skiing

New York Airways' first Sikorsky S-55 Skybus taking off from LaGuardia Field during opening ceremonies with full load of mail and parcel post. Present operations are between LaGuardia, Idlewild and Newark airports, a radius of 17 miles. Eventually service will extend to a 50 mile radius and will serve 43 communities in New York, New Jersey and Connecticut. Two more S-55s are on order. All New York Airways helicopters have been certificated to carry passengers and commercial freight as well as air mail and parcel post. The Skybus is fitted with emergency flotation gear and equipped with powerful radio and navigation instruments that are new for 'copters.



V-type tail was one of experimental empenages on Republic XF-91 "Thunderceptor"; also studied was T-type with stab atop rudder.



France's latest jet fighter-bomber, the S.N. C.A.S.O. Vautour. Landing gear is bicycle type; Atar engines, 6000+ lbs. thrust.



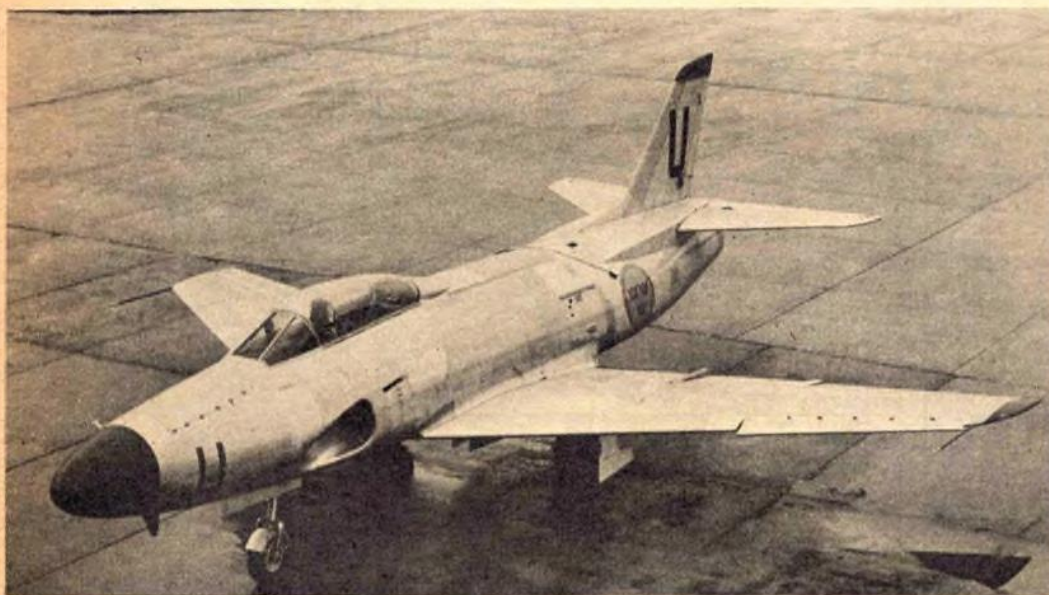
Left: model of Douglas D-558-2 Skyrocket equipped with a Hydro-ski. This device, though not new, has been under development by the NACA and the Navy. Ski utilizes hydroplaning principle to maintain buoyancy so long as the plane has sufficient forward speed. Upon landing, craft must taxi rapidly onto a ramp or shore. Actual experiments, using full-scale planes, SNJ and Piper, have been successfully conducted by All American Airways at Wilmington, Del. The Navy has no plans for this particular application of the hydro-ski to an experimental research aircraft, but announced new seaplane fighter, XF2Y, so equipped.

The S.I.P.A. S-12 French two-place advanced trainer now in production for the F.A.F. Plane is a development of the German Arado Ar 396, several of which were built by the S.I.P.A. concern during the occupation period. Construction is all metal. Engine a 580 hp Renault 12S. Span is 36 ft. 1 in., length 30 ft. 7½ in. Maximum speed 224 mph., service ceiling over 27,000 ft., cruising range 435 miles.





S.I.P.A. S-200, French light jet plane. Carries a crew of two and is designed for both military liaison and transitional training, is also a fast sport plane. Powered by a 360 lb. thrust Turbomeca Palas engine. Air intakes are in thickened wing roots. The S-200 has a sea level speed of 267 mph. Cruising speed at 3280 ft. (1000 meters) is 236 mph. It can climb at a rate of 1150 ft. per minute. Maximum ceiling is 26,250 ft. Wingspan 23 ft. 7 in., and the length is 16 ft. 9 in.



SAAB 32, Sweden's latest jet interceptor, air force designation A-32. Now in large-scale production for the Swedish Air Force. Plane is in the 700 mph class and is powered by a British Rolls-Royce Avon engine of 7200 lbs. thrust. Armament includes cannon, bombs and rockets; features comprehensive electronic equipment for navigation and combat in all kinds of weather. Large Fowler flaps and leading edge slots on its swept wing improve plane's stability and maneuverability at slow speeds. The new aircraft is primarily intended for attack against ground and sea targets. Is called Lance.

Grumman JRF Goose equipped with hydro-skis taking off from the frozen Lake Winnepesaukee, in New Hampshire. This is another use of the hydro-ski, on aircraft with buoyant hulls where the hydro-ski lifts the hull rapidly out of the water, thus cutting down the drag which slows take-off procedure. Edo Corp. conducted the experiments, proving that the hydro-ski is equally adaptable either for water or snow and ice operations. Edo found that take-off time in water was cut approximately in half, and landings could be made in waves about three times higher than would normally be considered safe for this particular type of plane.



Production type Piper Twin Stinson. Tail has been modified to single fin and rudder instead of earlier twin rudders. Wing tips are of fibreglass. In this photo plane shows its ability to perform on single engine. All production models will be equipped with Hartzell full-feathering propellers. Engines are Lycomings, each rated at 150 hp. Plane will be ready for delivery some time in middle of 1953.



# AIR PROGRESS

By DOUGLAS ROLFE



"ROCKET" NOZZLE

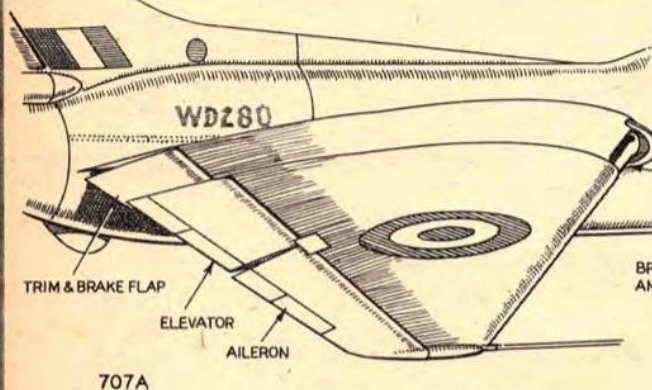
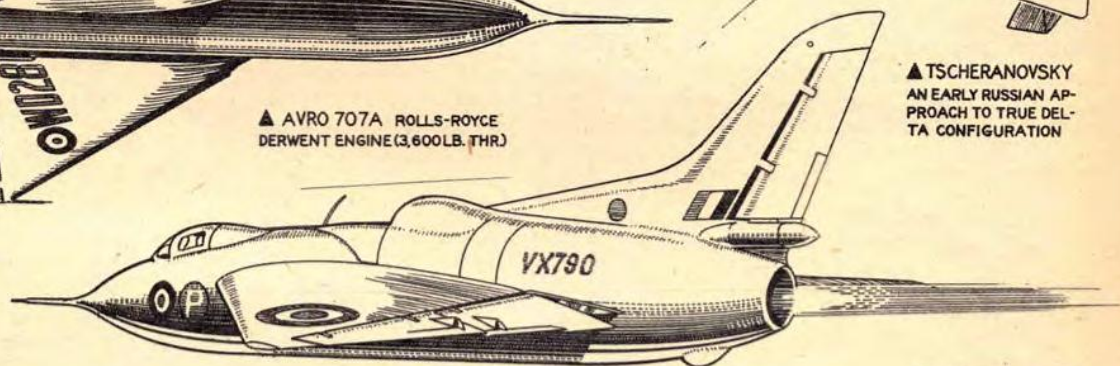
MOVING COCKPIT FORE  
AND AFT WAS PILOT'S  
SOLE MEANS OF REGU-  
LATING FORE AND AFT  
TRIM, CLIMB, DESCENT

BUTLER & EDWARDS (1867) ▲  
THIS PROJECTED DESIGN ENVISION-  
ED ROCKET PROPULSION (WITH GUN  
POWDER THE PROPELLANT FUEL) IS  
EARLIEST RECORDED DELTA DESIGN.

▲ SCROGGS A 1929 INTERPRE-  
TATION OF THE BUTLER-EDWARDS  
DESIGN. 90HP CURTISS OX-5 ENGINE

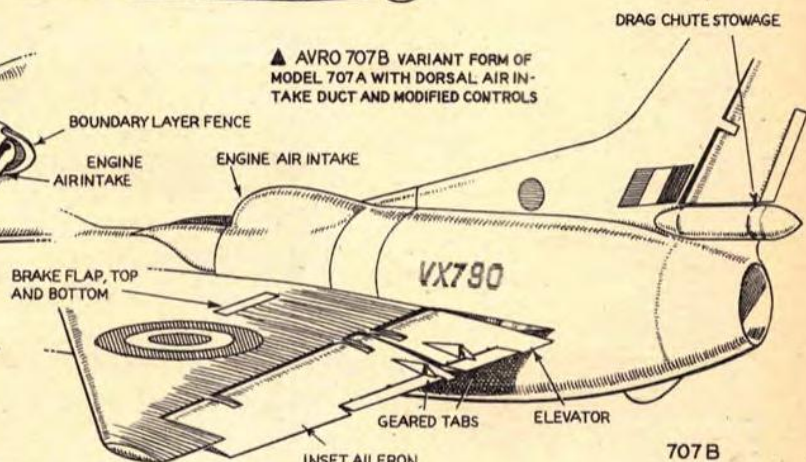
▲ AVRO 707A ROLLS-ROYCE  
DERWENT ENGINE (3,600LB. THR.)

▲ TSCHERANOVSKY  
AN EARLY RUSSIAN AP-  
PROACH TO TRUE DEL-  
TA CONFIGURATION



707A

▲ PRINCIPAL DIFFERENCES BETWEEN  
AVRO DELTA MODELS 707A AND 707B ▶



707B

## DEVELOPMENT OF THE DELTA WING

Interest in the delta wing configuration goes back as far as 1867 when two students of aerodynamics, Butler and Edwards, laid down the general principles for an aircraft of this type. As the illustration shows, their projected design was little more than a glorified paper dart.

The same general idea reappeared in the mid-twenties in the shape of the Scroggs Dart which was actually built. Yet another close approximation to the true delta configuration was designed and built at about this same time by Tschernanovsky. The two latter designs were not pursued, and the next we hear about this type of wing is the experimental work conducted by Lippisch in Germany during World War



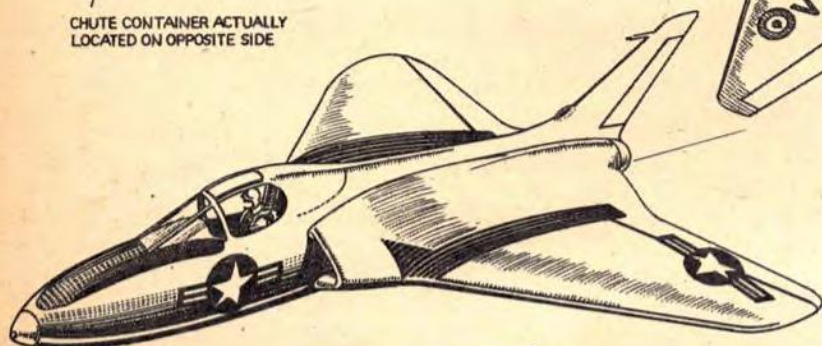
BOLTON PAUL P.III. THREE TRIANGLES WITH 45 DEGREE BASE ANGLES MAKE UP THIS LITTLE HIGH-SPEED RESEARCH PLANE. FIRST FLIGHTS DATE FROM LATE 1950. ▼



CHUTE CONTAINER ACTUALLY LOCATED ON OPPOSITE SIDE



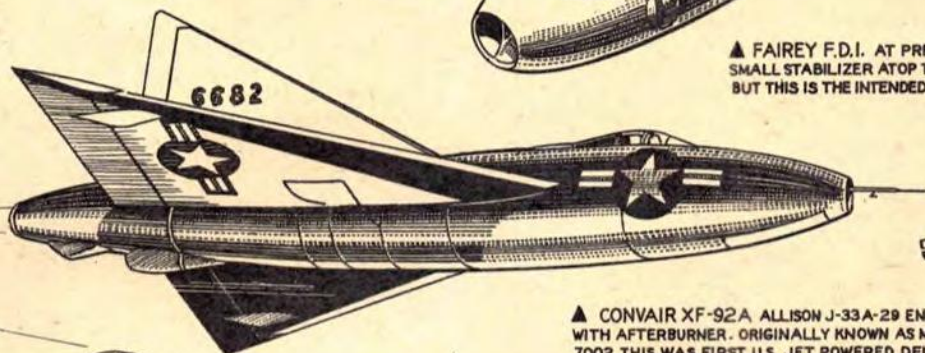
▲ AVRO 698 LATEST AND LARGEST BRITISH DELTA— ESTIMATED SPAN OF BOMBER IS 100 FT., LENGTH 120 FT.



DOUGLAS XF4D SKYRAY ▲ STILL IN THE RESEARCH STAGE, THIS IS ONE OF THE MORE ADVANCED U.S. TYPES AND IS PROBABLY ONE OF THE FASTEST YET BUILT



▲ FAIREY F.D.I. AT PRESENT HAS SMALL STABILIZER ATOP THE RUDDER BUT THIS IS THE INTENDED FINAL FORM



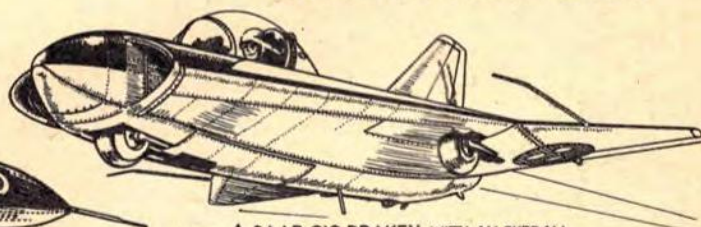
DOUGLAS ROLFE

▲ CONVAIR XF-92A ALLISON J-33A-29 ENGINE WITH AFTERBURNER. ORIGINALLY KNOWN AS MODEL 7002 THIS WAS FIRST U.S. JET POWERED DELTA WING PLANE (1948)— IS NOW IN FINAL TEST STAGE

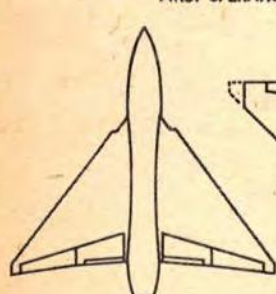


NOTE CURIOUSLY HIGH TAIL GROUP

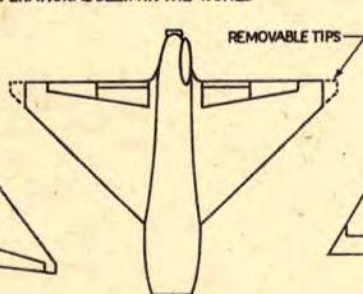
GLOSTER GA.5 JAVELIN TWIN ARM- ▲ STRONG SIDDELEY SAPPHIRE TURBOJET ENG. BRITAIN'S NEW ALL WEATHER FIGHTER AND FIRST OPERATIONAL DELTA IN THE WORLD



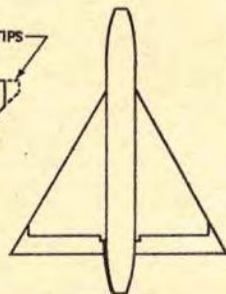
▲ SAAB 210 DRACKEN WITH AN OVERALL SPAN OF LESS THAN 17 FEET THIS SWEDISH RESEARCH PLANE IS WORLD'S SMALLEST DELTA



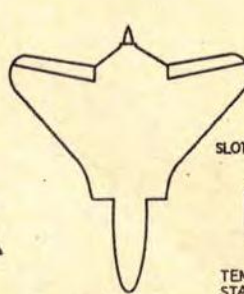
AVRO



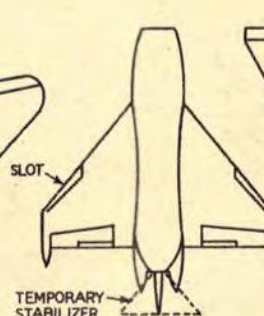
BOLTON PAUL



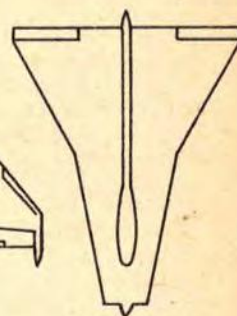
CONVAIR



DOUGLAS



FAIREY



S.A.A.B.

II. He, Lippisch, was convinced that the delta wing was essential to meet and solve supersonic-flight problems.

Since the war there has been a serious movement toward the delta wing configuration and more recently many varying types have been built for research purposes—both here and abroad. At present the British have a slight edge in this field with three or four models in the advanced research

stage and one, the Gloster G.A. 5, in the operational stage. They have also just unwrapped a king-size delta wing bomber—the Avro 698—which is probably in the advanced research stage and should soon be in operation.

Our own two major delta wing contenders have now reached the advanced research stage and may become operational in 1953.



# the Corsair's first **MiG** kill

Even though it was jet versus prop this Marine pilot stood a better chance of living by attacking the Red's vaunted fighter

By CAPT. JESSE G. FOLMAR, USMC (as told to JACK LEWIS)

■ The Communist MiG jet fighter was diving toward the earth, black smoke streaming out in a cone-like mass as I threw my Vought Corsair over on one wing, watching the enemy pilot's figure.

As the tight bundle of humanity, ejected from the cockpit, shot upward from the burning plane, it resembled a grey ball of smoke. At the peak of his ejection, the man's parachute opened and he started dropping gently toward the earth. Suddenly the grey smoke burst into a flame that encased the pilot's body and he struggled at the parachute's end.

My twenty-millimeter cannon must have opened a fuel tank and sprayed him with the fuel, I decided.

"Congratulations. You're the first American to shoot down a MiG with a prop-driven plane!"

It was my wingman, Willie Daniels, shouting into my radio headset. I was still watching that Red pilot, though, his clothing engulfed in flames as he neared the water. Even though he had tried to shoot me down, I felt a certain compassion. It was a hard way to go.

As he struck the salt water of the Yellow Sea, the flames were snuffed out.

"More MiG's!" Daniels warned through the radio headphones. I jerked my head up, staring at the sky above me. "Four more," Willie radioed.

"Break left, down!" I shouted into my own microphone. I jerked the Corsair over on its wingtip again. I saw from the corner of my eye something black and fast moving in. Red tracers started to go past my nose.

A sharp, jarring explosion almost ripped the controls out of my hands. The entire aircraft shuddered. Almost four feet of my left wing was gone. My left aileron had been ripped away by the shell from the enemy jet.

I barked the standard distress signal into the lip mike which hung close to my mouth and started to unfasten the safety harness which held me in the cockpit.

"I'm bailing out!" I warned, as I re-

leased the plastic canopy that protected the cockpit. It ripped away into the sky and I struggled up, fighting the hard wind that suddenly whipped about me, trying to force me back into the pilot's seat. The crash helmet was jerked off my head by its force and the lip microphone dragged across my face, stinging the skin.

Another black MiG was coming in toward me as I tumbled over the side of my crazily falling plane. I heard the sharp tattoo of cannon fire as I tumbled over and over into space, the air dragging at my body.

"One!" I was counting aloud, but I couldn't hear. The rush of air was driving the words back into my mouth. "Two! . . . Three!"

I jerked the D-ring on the parachute harness, feeling a return jerk as the pilot chute ripped free. Then, I was brought up short as the larger chute started to open. I glanced up, watching. The white nylon seemed to unfold over my head with the slowness of a night-blooming flower.

*Crack!*

The sound was near my ear. Then there was another sharp report and the roar of an engine. Another of the enemy jets was diving at me, nose cannon blazing. I watched, fear choking me as the plane dived past me, then started to pull up.

The pilot was trying to strafe me as I dangled helplessly at the end of the heavy network of nylon shroud lines.

The story doesn't start there, though; it begins earlier . . . earlier that same morning below the broad decks of the aircraft carrier *USS Sicily*. I was lying down going through the pile of letters that had just been flown aboard in an old World War II-vintage torpedo bomber. I had sorted them out according to dated postmarks and was opening them one at a time.

" . . . It's a little difficult to realize that your latest daughter is already a month old," my wife had written. "She'll be a big girl by the time you get home . . ."



Copyright 1952 United Aircraft Corp. Presented through courtesy of "The Bee-Hive."



"Pilots report to the briefing room! Report on the double!" The words were thick coming over the ship's intercom system, but they couldn't be ignored. I sat up, stuffing the letter into the pocket of my flight suit and picked up my gloves. It was the order I had been awaiting.

The briefing was fast but thorough. There would be four of us. Two of the pilots would be on a combat air patrol in the vicinity, while Lieutenant Willie Daniels and I would take in bombs to blast away at the concentration of 300 North Korean troops that had been

reported on the west coast of the enemy-held portion of Korea.

"One last word," the briefing officer reminded, as he finished his monologue. "Remember that if you're jumped by MiGs, drop your ordnance and extra fuel tanks and turn into them. You might stand a better chance by attacking than trying to run."

There was the babble of voices through the room as the briefing broke up and men started up for the flattop's deck. I lingered for a moment, staring at the map. I had been jumped once by a MiG and had gotten away. He

might have finished me, had he not been anxious to get back to the North and had flown away after only a few jabs in my direction with his cannon fire. What our boy had said about attacking instead of running, though, made some sense. A propeller-driven plane is just no match for a jet fighter as advanced as the MiG.

Some of the bent-winged Corsairs of the Marine "Checkerboard" squadron already were warming up as we came up on the deck. I shaded my eyes against the glare and moved along the line to where my plane waited. Daniels went on to his plane, as I circled the ship, checking it and the ordnance. It's a ritual. Over North Korea is no place to suddenly discover that you made a mistake or were careless before take-off.

I was on the catapult waiting to be shot off the deck into space, when I remembered the letter from my wife. I had only been in Korea for six months. It was going to be a few more months before I would get to see that daughter of mine. My head jerked back against the rear of the cockpit as the signalman waved his hand forward and the catapult shot me down the deck with the force of a sling-shot. I pulled back on the yoke, lifting the Corsair into the air. It was almost second nature. With fourteen years in the Marine Corps, I had been flying the gull-winged craft in two wars. I was still thinking about the letter. A combat patrol and an attack on enemy troops under the threat of MiG fighters was no time to be inspecting one's personal mail. I leaned forward, however, feeling in the leg of my flight suit to find that it was still tucked among the maps there.

Down below, the carrier was a long splinter on the surface of the Yellow Sea, with black dots that were more Corsairs being shot off the end of the carrier deck.

As Lieutenant Daniels joined up on my wing, I swung the plane northward. Below, islands dotted the area off the coast. Most of them were friendly, I knew.

The water was nothing but a blue glass surface like one of those tinted mirrors that some people use on their coffee tables at home. Off to the east, the shoreline was hidden by the thin line of haze that hangs over the Korean countryside after the initial smooth calm of the morning. Over there, in that hazy blanket, was the enemy.

It had been the same kind of day only a few afternoons before, though, when I had been jumped by the enemy MiGs and had dived for the sea in an effort to shake them off. I glanced skyward now, looking for enemy jets.

There were supposed to be 300 troops, but we found none. The valley where they had been (Continued on page 56)





# Air Trails<sup>®</sup>

MARCH 1953 / 35 CENTS



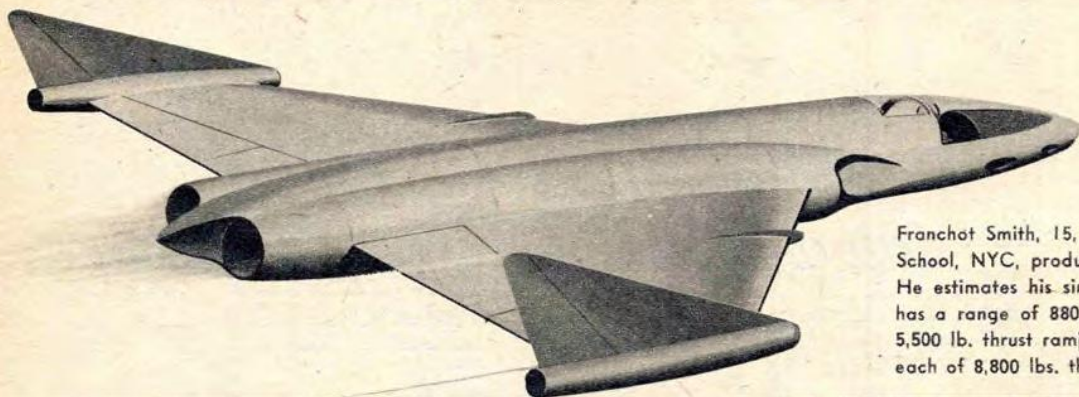
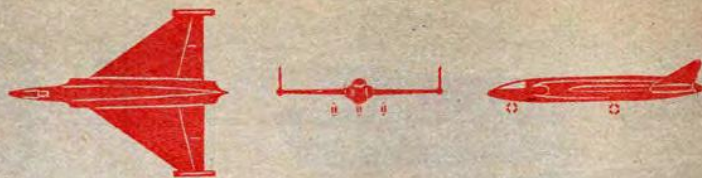
Gloster  
Javelin

Picture Story: AIR-SAILORS AT SEA  
SPECIAL: When They Really Built Models!

ALFRED  
SUNTS



## 1<sup>ST</sup> AWARD Four jets power delta wing interceptor

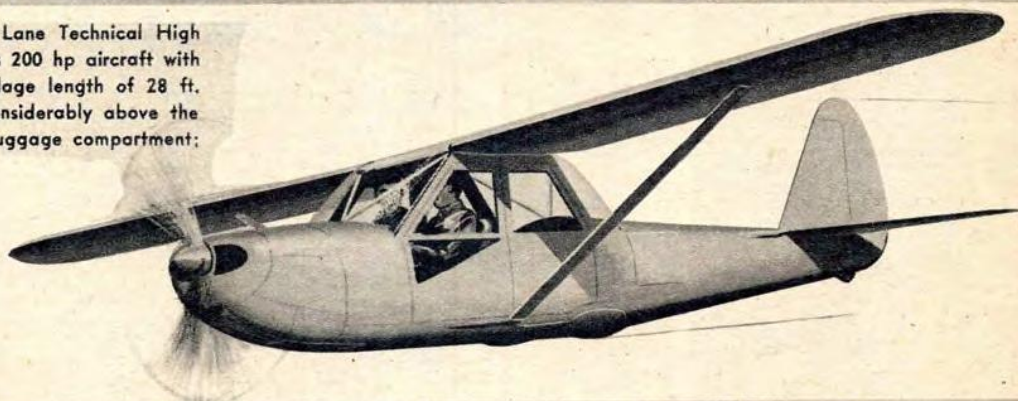


Franchot Smith, 15, of the George Washington High School, NYC, produced the top design for this issue. He estimates his single-seat fighter will do 770 mph, has a range of 880 miles and climbs at 16,000 fpm; 5,500 lb. thrust ramjets on wingtips; 2 axial turbo-jets each of 8,800 lbs. thrust.

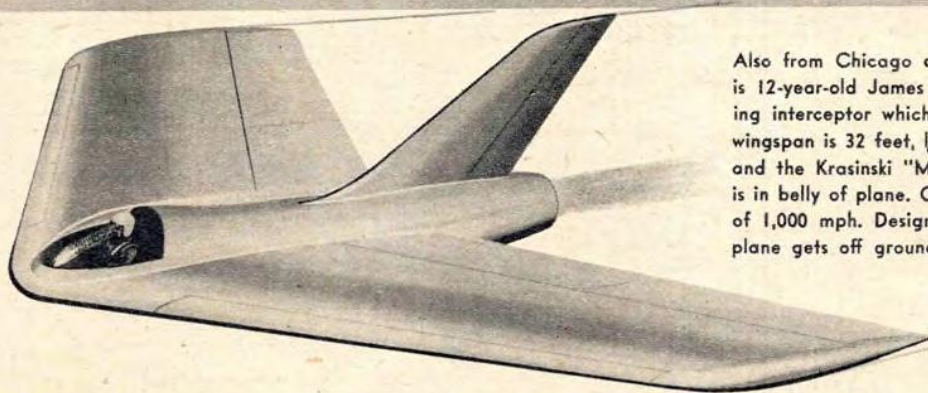
## 2<sup>ND</sup> AWARD High wing 4-pass. personal plane



Herman Loellbach, 14, of the Lane Technical High School, Chicago, developed this 200 hp aircraft with wingspan of 37 ft. and a fuselage length of 28 ft. He figures top speed to be considerably above the 150 mph mark. Features large luggage compartment; slots on wing.



## 3<sup>RD</sup> AWARD Moth-wing high-flying fighter



Also from Chicago and also quite young, third place man is 12-year-old James Krasinski. Jim designed this fast-climbing interceptor which uses a ramjet engine for power. The wingspan is 32 feet, length is 23 feet through the "fuselage" and the Krasinski "Moth" features ejection seat. Air intake is in belly of plane. Ceiling is 70,000, speed is in the vicinity of 1,000 mph. Designer did not reveal any details on how plane gets off ground—a problem with an all-ramjet craft.

## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.

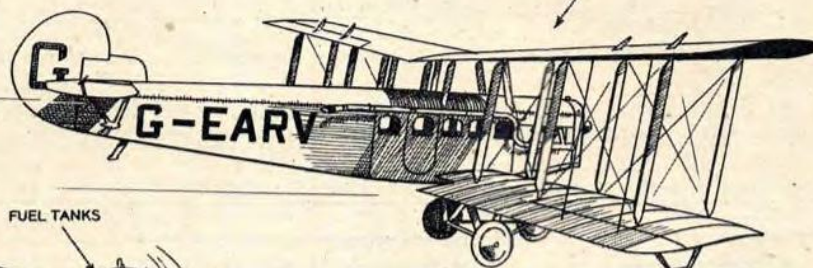


# AIR PROGRESS

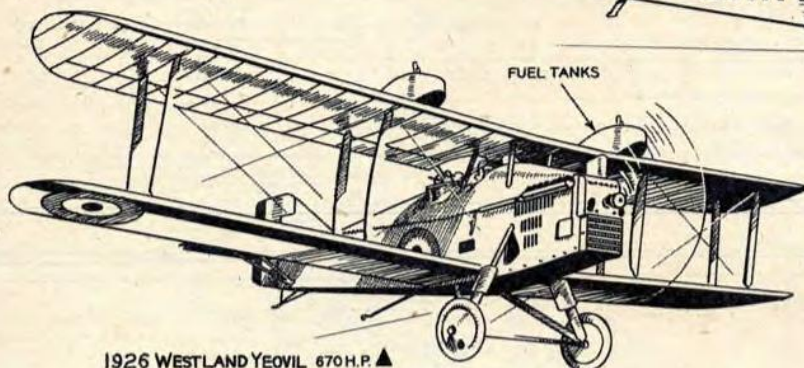
By DOUGLAS ROLFE

## THE WESTLAND STORY

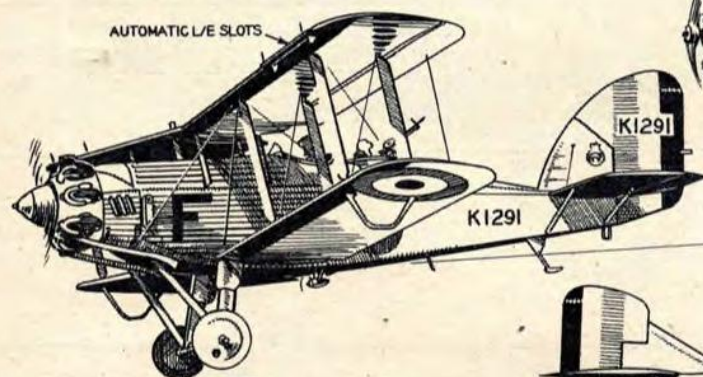
NOT TO BE CONFUSED WITH THE WESTLAND  
IV TRI-MOTOR LIMOUSINE AIRLINER (1929)



▲ 1924 WESTLAND LIMOUSINE ONE OF THE FIRST  
SPECIALLY DESIGNED COMMERCIAL AIRLINERS BUILT TO  
REPLACE THE CONVERTED WORLD WAR I BOMBERS GEN-  
ERALLY EMPLOYED DURING THE FIRST POST-WAR YEARS



1926 WESTLAND YEOVIL 670 H.P. ▲  
ROLLS-ROYCE CONDOR ENGINE. TYPICAL R.A.F. DAY-BOMBER OF THE PERIOD



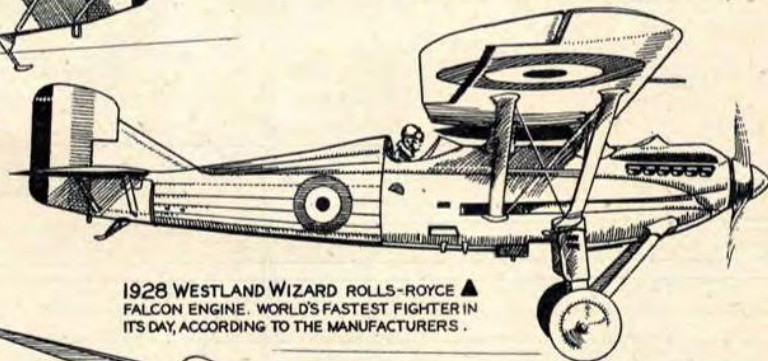
AUTOMATIC L/E SLOTS

1928 WESTLAND WAPITI 450 H.P. BRIS-  
TOL JUPITER ENGINE. FOR NEARLY A DECADE  
THE STANDARD R.A.F. GENERAL-PURPOSE TYPE

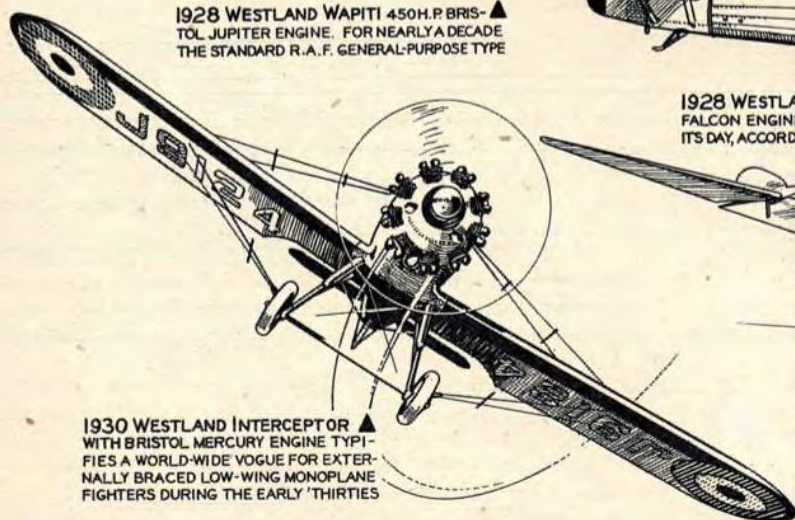


NOT TO BE CONFUSED WITH  
THE 1929 MK.IIIA WIDGEON

▲ 1926 WESTLAND WIDGEON 60 H.P.  
SIDDELEY GENET ENGINE. THIS SMALL 2-  
PLACE SPORTPLANE COULD TOP 105 MPH.



1928 WESTLAND WIZARD ROLLS-ROYCE ▲  
FALCON ENGINE. WORLD'S FASTEST FIGHTER IN  
ITS DAY, ACCORDING TO THE MANUFACTURERS.



1930 WESTLAND INTERCEPTOR ▲  
WITH BRISTOL MERCURY ENGINE TYPICAL  
A WORLD-WIDE VOGUE FOR EXTERNALLY  
BRACED LOW-WING MONOPLANE  
FIGHTERS DURING THE EARLY 'THIRTIES

1926 WESTLAND-HILL TAIL-LESS ▲  
32 H.P. BRISTOL CHERUB ENGINE. EXPERI-  
MENTAL PROTOTYPE MODEL PTERODACTYL

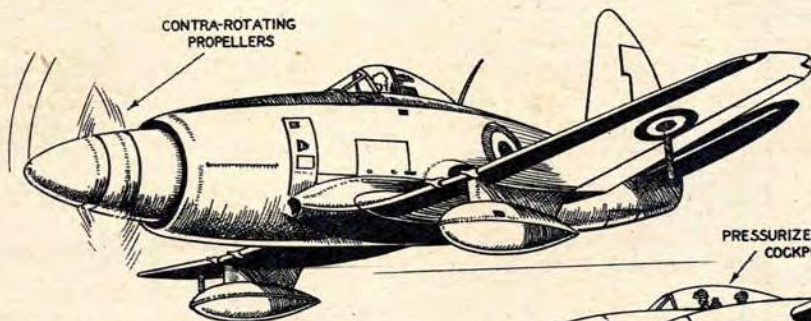
Not too well-known in America but still one of the older aircraft manufacturers in business today, Westland Aircraft dates from World War I when this company, a subsidiary of the engineering firm of Petters Ltd., started making airframes and completed airplanes under contract from established manufacturers' designs.

The first genuine Westland aircraft did not appear until

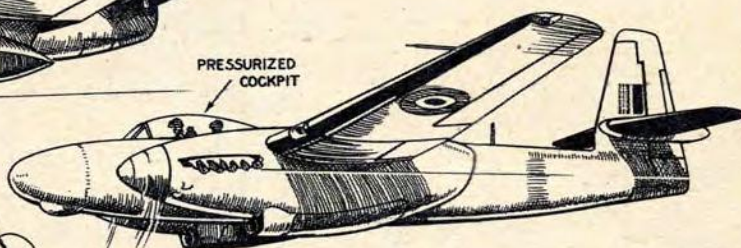
after the Armistice in 1919 and at that period were mostly commercial types. Later, like so many other aircraft companies all over the world, Westland was obliged to rely on government support for its daily bread, hence concentrated on military and naval designs.

Westland was among the first to produce a high-performance, long-range escort fighter, and the Westland Whirlwind,

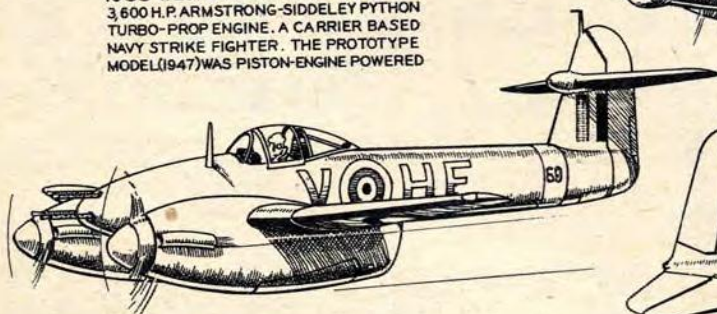




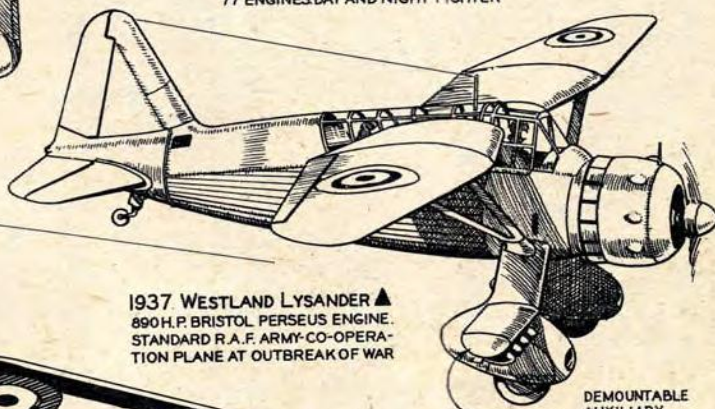
1953 WESTLAND WYVERN T.F.-2 ▲  
3,600 H.P. ARMSTRONG-SIDDELEY PYTHON  
TURBO-PROP ENGINE. A CARRIER BASED  
NAVY STRIKE FIGHTER. THE PROTOTYPE  
MODEL (1947) WAS PISTON-ENGINE POWERED



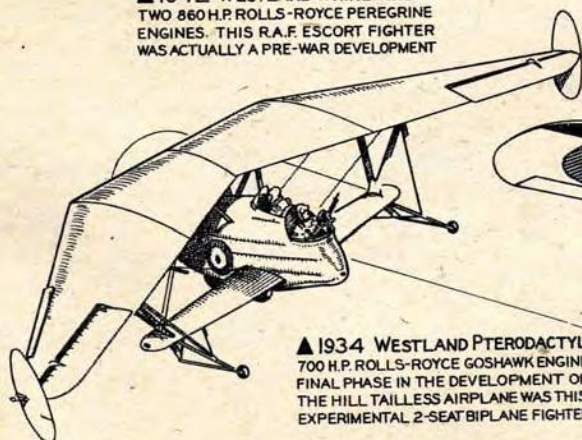
▲ 1946 WESTLAND WELKIN IIa  
TWO 1,655 H.P. ROLLS-ROYCE MERLIN  
77 ENGINES DAY AND NIGHT FIGHTER



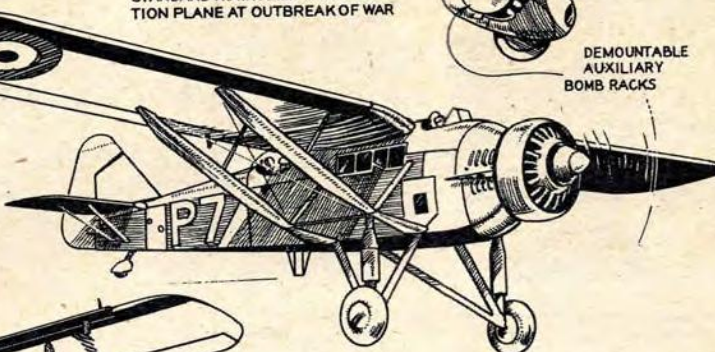
▲ 1942 WESTLAND WHIRLWIND I.  
TWO 860 H.P. ROLLS-ROYCE PEREGRINE  
ENGINES. THIS R.A.F. ESCORT FIGHTER  
WAS ACTUALLY A PRE-WAR DEVELOPMENT



1937 WESTLAND LYSANDER ▲  
890 H.P. BRISTOL PERSEUS ENGINE.  
STANDARD R.A.F. ARMY-CO-OPER-  
ATION PLANE AT OUTBREAK OF WAR



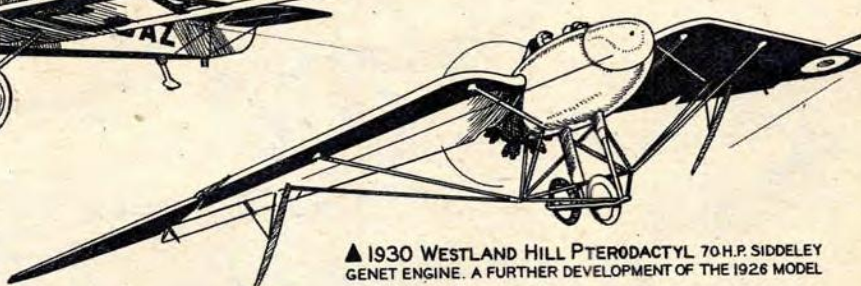
▲ 1934 WESTLAND PTERODACTYL  
700 H.P. ROLLS-ROYCE GOSHAWK ENGINE.  
FINAL PHASE IN THE DEVELOPMENT OF  
THE HILL TAILLESS AIRPLANE WAS THIS  
EXPERIMENTAL 2-SEAT BIPLANE FIGHTER



▲ 1934 WESTLAND P.V.7 675 H.P.  
BRISTOL PEGASUS ENGINE. A SHOULDER  
WING MONOPLANE DESIGNED AS A NAVY  
DIVE BOMBER AND TORPEDO CARRIER.



1933 WESTLAND HOUSTON P.V.3 ▲  
675 H.P. BRISTOL PEGASUS ENGINE. FIRST  
AIRPLANE TO FLY OVER AND COMPLETE A  
PHOTOGRAPHIC AERIAL SURVEY OF MOUNT  
EVEREST. CREW AND CAMERAS WERE IN-  
SULATED BY ELECTRIC HEATING ELEMENTS



▲ 1930 WESTLAND HILL PTERODACTYL 70 H.P. SIDDELEY  
GENET ENGINE. A FURTHER DEVELOPMENT OF THE 1926 MODEL

designed prior to World War II, was probably the first such Allied fighter available during hostilities to afford protection to the mass bomber penetration of the Third Reich. The present-day Wyvern, one of the few turboprop fighters in service, compares favorably with all but the most modern jet-powered types in this field and is one of the most powerful strike fighters in service today anywhere in the world.

Westland also made a notable contribution to aviation in its long research into the possibilities of the all-wing airplane. These experiments, which terminated in the curious 1934 Pterodactyl fighter shown on these pages, resulted in most of the practical data available today on this form of aircraft.

Definitely, Westland has contributed to air progress.



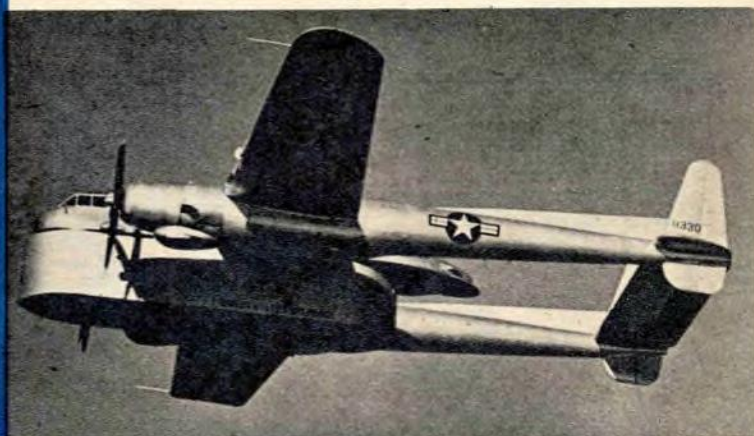
## The World A-Wing



High-altitude, pressurized suit specially designed to save crew lives in event pressure in cabin fails at altitude above 45,000 ft. Helmet divides in two halves, has transparent faceplate, oxygen supply.



Flying Trailer. Detachable cargo compartment designed to be attached to the Fairchild XC-120 Pack Plane. It is equally at home on highway and in the air. Has same cargo capacity as C-119, Hitchable to any military or civilian heavy vehicle.

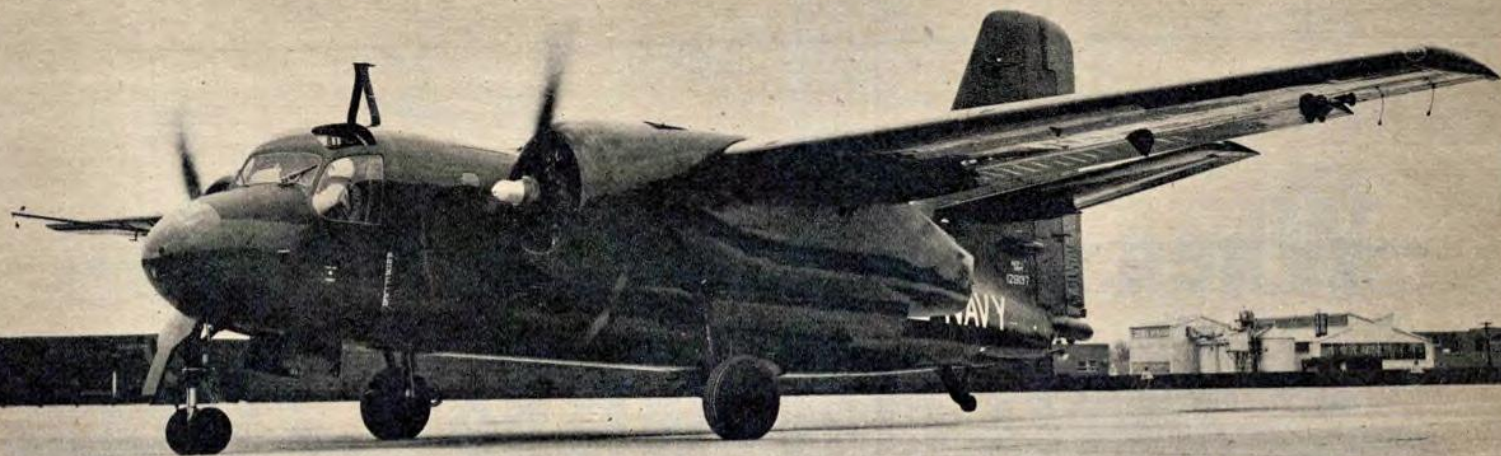


Golden Year Cessna 170. Latest model of the popular four-place personal plane named in commemoration of the Golden Anniversary of Aviation. Plane has a longer, sleeker nose and Para-Lift flaps as on the L-19 Bird Dog. Other changes are revised instrument panel, better heating and ventilation. Cruises at 120 mph.



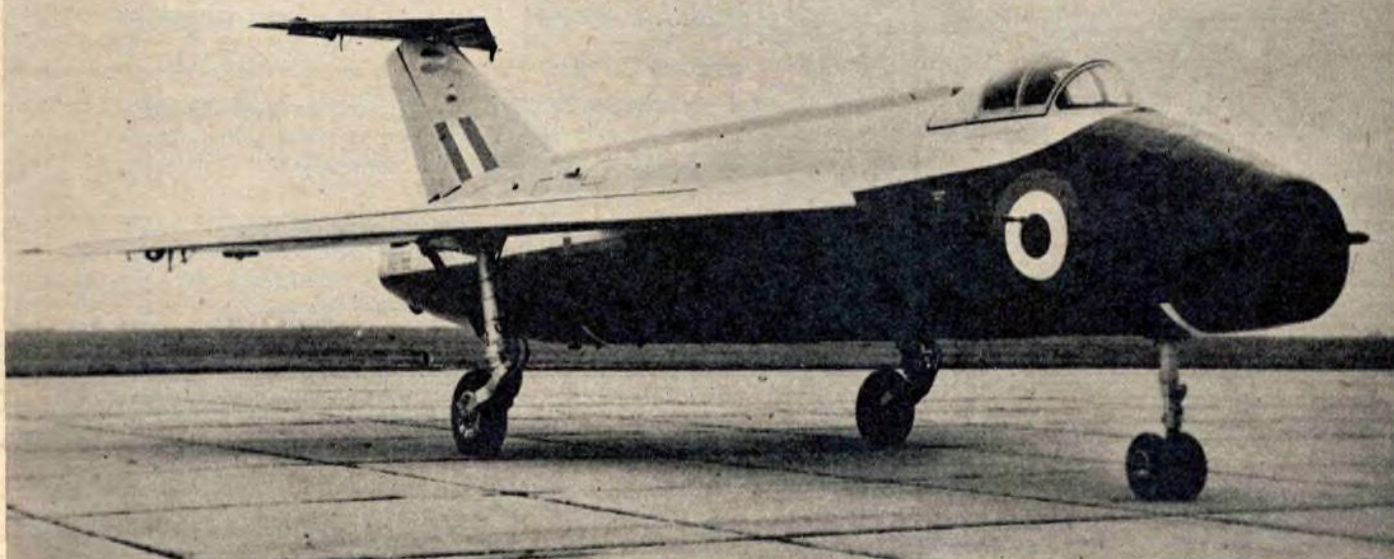
## U.S. TESTS WORLD'S FIRST DELTA WING SEAPLANE



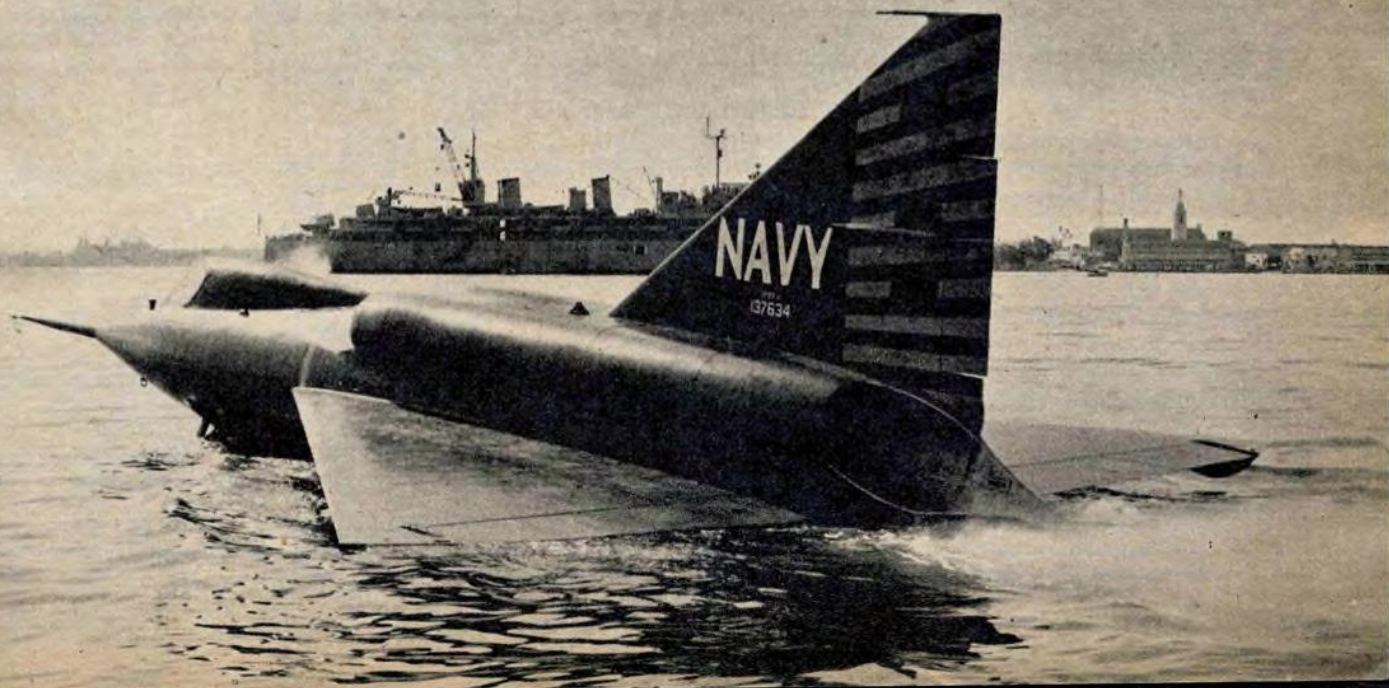


Navy's latest anti-submarine plane, the Grumman S2F-1, carries latest sub-detecting and destroying devices. Crew of four. 1400 hp engines.

Short S.B./5, England's newest swept-wing jet research plane. Angle of sweep is adjustable on ground. 3600 lb. thrust R.R. Derwent.



Convair XF2Y-1 Sea Dart. World's first delta wing seaplane jet fighter undergoing test in San Diego Bay. Hydro-skis, 2 West. jets.





APRIL 1953/35 CENTS

# Air Trails®

Death at Dawn  
for the L. Z. 37

Dick Sladek's  
Top-time National  
PAA-Load Winner

Air Progress Sketches:  
Fairchild Planes

Fieseler "Storch"  
Free Flight Model



REPORT ON THE RUSSIANS:

The Red Air Force is Ready! — Pg. 19



# Air Trails

—THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

**Editor:** Albert L. Lewis. **Technical Editor:** Alexis Dawydoff. **Editorial Production:** Carl Happel. **Art Director:** W. F. Tyler. **Editorial Assistants:** Rose Borello, Barbara Grey. **Correspondents—Radio Models:** Howard McEntee; **West Coast Modeling:** Dick Everett.

## STREET & SMITH PUBLICATIONS, INC.

**President:**.....Gerald H. Smith  
**Executive Vice President:**.....Ralph R. Whitaker, Jr.  
**Vice President and Secretary:**.....Arthur P. Lawler  
**Treasurer:**.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 2550 Beverly Blvd., Los Angeles 4, Calif., and 681 Market St., San Francisco 5, Calif.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright, 1953, by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. 35¢ per copy. This issue is Vol. XL, No. 1. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

Cover by Roy Cross shows (top) Reds' U-MIG-15 2-seater jet trainer. At bottom is U-118 pilot conversion trainer version of well-publicized U-118 attack bomber, many of which are reported based opposite Japan



April, 1953 • Vol. 40, No. 1

## FOR THE READER

|                                 |    |
|---------------------------------|----|
| "AT" FORUM                      | 8  |
| R/C ROUNDUP—HOWARD McENTEE      | 10 |
| AIR NOTES                       | 12 |
| AIRMEN OF VISION                | 14 |
| F-84F THUNDERSTREAK             | 16 |
| THE RED AIR FORCE IS READY      | 19 |
| —WILLIAM GREEN                  |    |
| AIR PROGRESS: FAIRCHILD STORY   | 22 |
| —DOUGLAS ROLFE                  |    |
| THE WORLD A-WING                | 24 |
| DEATH AT DAWN FOR THE L.Z.      | 26 |
| —DONALD NAUGHTON                |    |
| HALF-A PAA-LOAD WINNER: TOP     | 28 |
| NATIONAL PLANE—DICK SLADEK      |    |
| STEP UP AND MEET                | 31 |
| AIR-MODEL MANUAL: TOWLINERS     | 32 |
| JENNY WAS A REAL LADY           | 34 |
| —DICK EALY                      |    |
| SOVIET AIR FORCE U-IL-28        | 37 |
| HUREL DUBOIS H.D. 10            | 38 |
| STUNT SNAPS                     | 39 |
| NATIONAL SPEED PICTURE          | 40 |
| SPEED BUG—FRANK EHRLING         | 40 |
| FIESELER STORCH FI 156          | 44 |
| —CARL G. AHREMARK               |    |
| CONVERTING TO 27 1/4—H. McENTEE | 46 |
| TWIN-FIN TERROR                 | 48 |
| —ANTHONY D'ALESSANDRO           |    |
| BERKELEY'S SHOESTRING RACER     | 49 |
| ALLYN SALES' SCALE SKYSHARK     | 49 |
| MOTOR OF MONTH: WEN-MAC .049    | 50 |
| DOPE CAN—THE DOPESTER           | 56 |
| WESTERN ROUNDUP—DICK EVERETT    | 60 |
| FOREIGN NEWS NOTES              | 66 |
| SHOWCASE                        | 76 |

## FROM THE READER

**He Flew in First Dirigible . . .** I was much interested to note your illustration of the first successful dirigible described on page 34 of your "Air Progress."

For your information this dirigible was built in Los Angeles, Calif., in 1904 in Chutes Park. I had a small machine shop nearby and did a lot of the work on this ship and flew with Capt. Baldwin on its first flights. Capt. Baldwin had an associate, a Capt. Navenshoe. Like most early motors the engine would not run very long and we had two long ropes which we would let down to the ground and people would pull us back to Chutes Park.

We sat on a couple of boards across the triangular frame under the bag and when we wanted to go down we slid the boards forward, and backward to go up. We didn't know what an aileron was at that time.

W. H. Hollister, Consulting Engineer, Oak Park, Ill.

**Wants Twin-engine Scale . . .** I'd just like to say that I think Walt Musciano's plans are great. But why stick to single-engined aircraft? How about some twin-engined scale ships, such as the C-45, C-46, C-47, C-119, twin Bonanza, Twin Navion, Aero Commander and such. Those twin-engined ships really sound sweet in the air. I hope we'll see some in Air Trails.

A/2c A. E. Swanson, Former Vice-President Circle Aces, Guam.

• See Air Trails "Annual" for 1953 and the March issue of Air Trails for twin-engine models.

**Research on Douglas Mail Plane . . .** Enclosed you will find a money order in the amount of thirty-five cents for your plan #1151. I want this for the Douglas Mail Plane as a few of us at the Douglas Long Beach Engineering Dept. are digging into the Engineering Records Dept. at Santa Monica for further authentic information on the ship and hope to come up with some nifty scale free flights.

Grover W. Moore, Corona Del Mar, Calif.

**Correction on "Short Circuit" . . .** Dick Everett had the information wrong on the picture in his column in the February Air Trails. It was my model all right but I did the design work with suggestions from Bob and I was using Aerotrol receiver and Aristrol transmitter instead of 465 mc. equipment. Incidentally, I have tried out Macnabb's new 27 mc. transmitter and find it is really potent. . . . I plan to modify one of these for tone modulation and put the tone equipment where the batts are now and run a cable to a separate batt box.

Doug Spreng, Burbank, Calif.

• Sorry, Doug. Thanks for the info.

**Doug Rolfe's Jenny . . .** Working on the drawings for "Jenny Was a Real Lady" sure brought back memories. More years ago than I care to dwell on, my brother and I picked up three crashed Jennys and from the combined remains built one serviceable ship. We did all the work ourselves, including covering, doping and painting. And the rigging (which was really something). We even carved a set of cabane struts. The top wing of the finished job had no less than five splices in the main and rear spars. The top fuselage longerons had two splices which we reinforced with sheet steel jackets. I suppose such a job would not get by inspection today but the fact remains that we carried hundreds of passengers in this plane without incident and gave it the full aerobatic treatment.

I wonder if amongst your readers there are any very old-time Marine pilots who remember the bright yellow Jenny which visited them at Paris Island and into which they so obligingly installed a brand-new motor and a set of instruments the like of which no Jenny of its day was ever known to carry, all in return for free rides for the officers' wives and girl friends. I wonder? This same ship of ours was also used on charter by the old Runser-Turner team in their wing-walking act when one of their own ships was out of commission. I don't know whether Roscoe knew about the splices, though.

Douglas Rolfe

**Color Scheme of L-19 . . .** This is the first time I've ever written to any magazine to make comments of any kind. First I want to say that you have the finest model aviation magazine I have ever seen.

My comment concerns the model of the Army L-19 aircraft you had in a recent issue. In one picture you showed the "real" thing in official Army dress of O. D. paint and silver numbers and lettering. On the best authority I correct you by saying all lettering and numbers are international orange-yellow. I'm an ex-Army Sgt. whose duty it was to paint this particular aircraft in an Army Ordnance Light Aircraft Maintenance Company. A new Army Special Regulation published not long ago states that all Army aircraft will now be all O. D. No more gray undersurfaces. Also, the lettering U. S. Army will replace the letter A and three numerals now on the wings. The vertical stabilizer still has the lettering U. S. Army and a minimum of four radio call numbers made up of the year model of the aircraft and the last three numbers of the serial number. Having worked with and on the L-19 since its introduction into the Army in spring of 1951 (that's when they first got to my base), I must say it's a wonderful aircraft and the model looks like a clean little outfit.

Harry W. Ishoy, Sacramento, Calif.

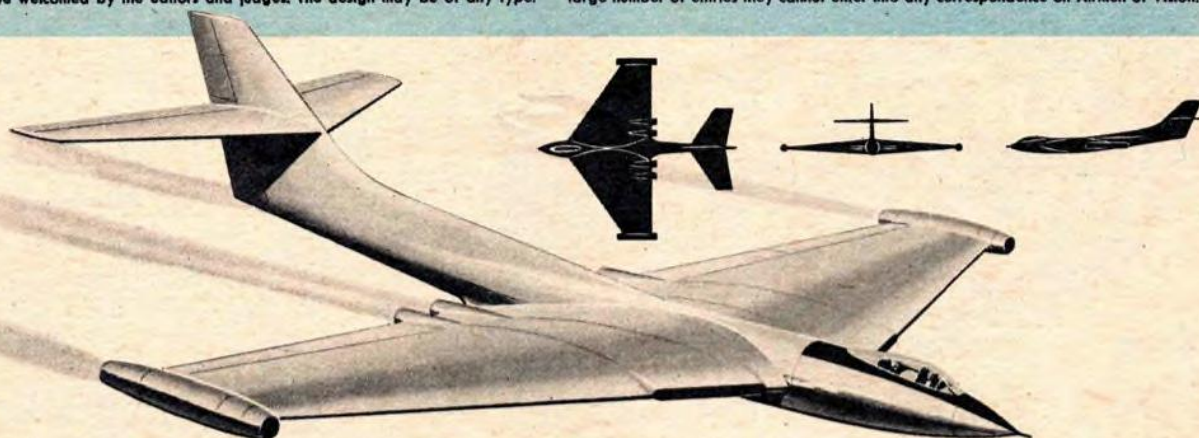
All communications to the editors should be addressed to 304 East 45th St., New York 17, N. Y. **Subscription prices:** U. S. and Possessions—\$3.50 per year, \$6.00 for two years; Canada—\$4.00 per year, \$7.00 for two years; countries of the Pan American Union—\$7.00 per year, \$10.00 for two years; elsewhere—\$10.00 per year, \$14.00 for two years. Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th St., New York 17, N. Y.



# AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes, (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



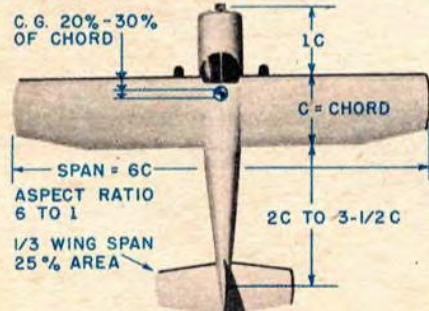
**BEST DESIGN OF MONTH:** Air Force S/Sgt. Wm. R. Kneller, currently overseas (3rd Shoran Flight, APO 83, Postmaster N.Y.C.) gets first honors this month for his long-range bomber or transport

design. It is powered by six jet engines, four in wings, two at wing-tips, each 10,200 lbs. thrust. Two radar-guided air-to-air missiles. As transport: clamshell doors in nose, elevator in wings. Span 180 ft.

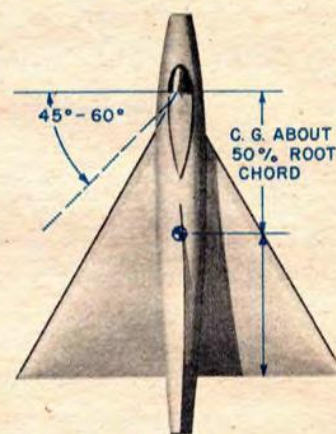
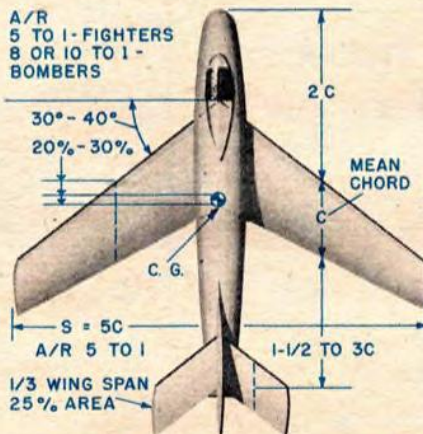
**LOADING AND SPACE REQUIREMENTS** for crew, passengers, bombs, guns, freight, powerplant and fuel form an important consideration in your design. Location of various parts determine C.G. (center of gravity) and this location has definite limits as shown. Grouping all engines in tail of a bomber, for instance, would

not make a flyable design, so try to keep all heavy items such as engines, fuel, bombs, etc., near C.G. or balanced evenly around it. Here are outline dimensions of some of the elements that must be considered. The general engine types are shown with dimensions of the largest used at present. Allow enough space for your powerplants.

## BASIC PROPORTIONS



TYPICAL ASPECT RATIOS (A/R)  
5 TO 1 - FIGHTERS, RACERS  
6 TO 1 - LIGHTPLANES, FIGHTERS  
8 OR 10 TO 1 - TRANSPORTS, BOMBERS



## CREW & ENGINE SIZES TO THE SAME SCALE

0 1 2 3 4 5 6 7 8 FT.



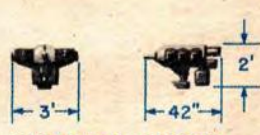
SEATED PILOT



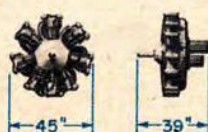
PRONE PILOT



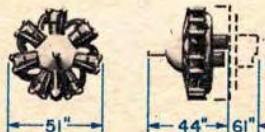
PASSENGER



HORIZONTAL OPPOSED  
200 H.P. PISTON ENGINE



200 H.P. RADIAL



1000 H.P. SINGLE ROW  
2000 H.P. DOUBLE ROW



3500 H.P.  
FOUR ROW  
"CORNCOB"



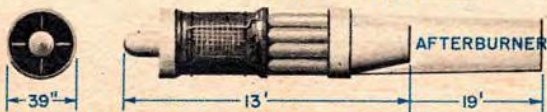
28 CYLINDERS  
"CORNCOB"



CENTRIFUGAL FLOW TURBOJET  
5000 + LBS. THRUST



RAMJET (EXPERIMENTAL)



AXIAL FLOW TURBOJET 10,000 LBS. THRUST



LIQUID FUEL ROCKET





Arctic based La-17 jet fighters of the PVO (Anti-aircraft Defense) are equipped for in-flight refueling. System is the "probe and drogue."

## The Red Air Force Is Ready—1

Razor sharp, Soviet air might is capable of attacking us NOW. Here's latest dope

By WILLIAM GREEN—Illustrated by ROY CROSS

■ According to Western air intelligence estimates, the overall first-line strength of the Soviet Air Fleet is currently 20,000 combat airplanes, a figure that has remained relatively unchanged for the past two years. But the ratio of piston-engined airplanes to jets has altered radically. Two years ago it was roughly 80-20 in favor of piston-engined planes; the scales now weigh heavily in favor of jets. About 7,000 combat airplanes are based in the deployment belt formed by Russia's satellites. European Russia and Siberia house a further 8,000. The remaining 5,000 are based in Far Eastern areas.

Another 20,000 airplanes of various types are in second-line reserve, and to be taken into account when assessing Red numerical strength are the air arms of the countries within the Soviet orbit. Add to the Soviet Air Fleet the satellite air arms and we point up the first-line strength of the Communist sphere to around 25,000 combat airplanes.

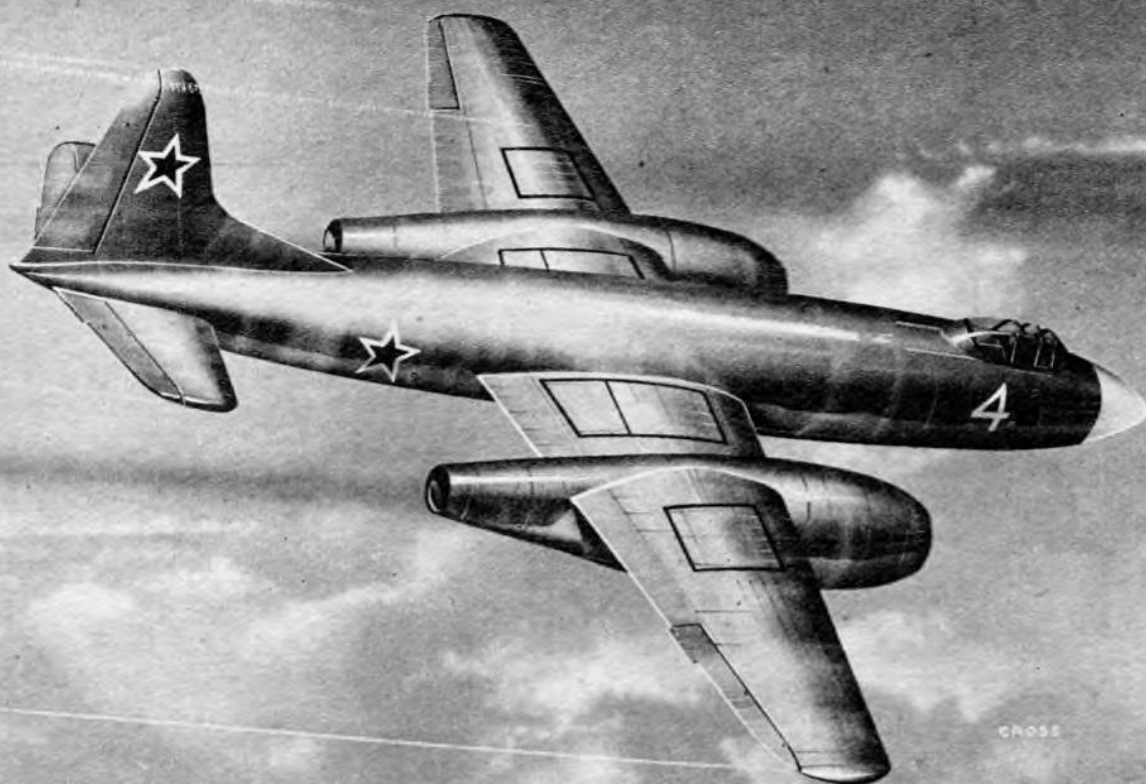
The conception of Russia as a land army power possessing air forces solely for the purpose of tactical support is now a myth. The Soviet Air Fleet or *Sovietski Voenno-Vozdushni Flot*, commanded by General-Pol-

kovnik Pavel Zhigarev, remains tactical in concept and subservient to requirements of the Army, but on this army-support concept of air power have been superimposed both a powerful strategic striking force, geared for trans-polar warfare, and a home-defense organization, now re-worked to counter U. S. bombing attacks even on a round-the-clock basis.

In the past two years, Russia's strategic striking force, the *Aviatsiya Dalnyego Deistviya*, or ADD, has gained considerable autonomy. Its expansion and modernization program has received top priority. Very conscious of the polar concept of air warfare, the ADD is largely concentrated in the Arctic, for the shortest routes for Soviet bombers headed for U. S. industrial centers lie across the North Pole.

Russia is far ahead in the race to develop Arctic bases. Commanded by General A. Ye. Golovanov, the ADD uses a chain of bases stretching across Russia's Arctic Circle belt, from Murmansk in the West to the Anadyr airfield complex in the East. Possessing at least two fields on Novaya Zemlya, straddling the 75th parallel, the ADD has bases on the Taimyr peninsula and in the New Siberian Islands, also lying across this parallel.





This is a provisional drawing of a Soviet light attack jet bomber. Craft is believed to be designed by Ilyushin and is known as Type 35.

## Mainstay of Red Vozdushni

**Sili (Air Force) is a variety of jet planes featuring advanced design know-how**



Further bases are under construction on the island of Servenaya Zemlya and on Frans Josef Land, both of which lie across the 80th parallel.

At the present time the standard Russian strategic bomber is the Tupolev Tu-4, a "pirated" copy of the Boeing B-29. Some 1,500 of these bombers are currently available to the ADD; sixty percent of this strength is in the Arctic area, the remainder being situated for attack against Western Europe, the Mediterranean area and the Far East.

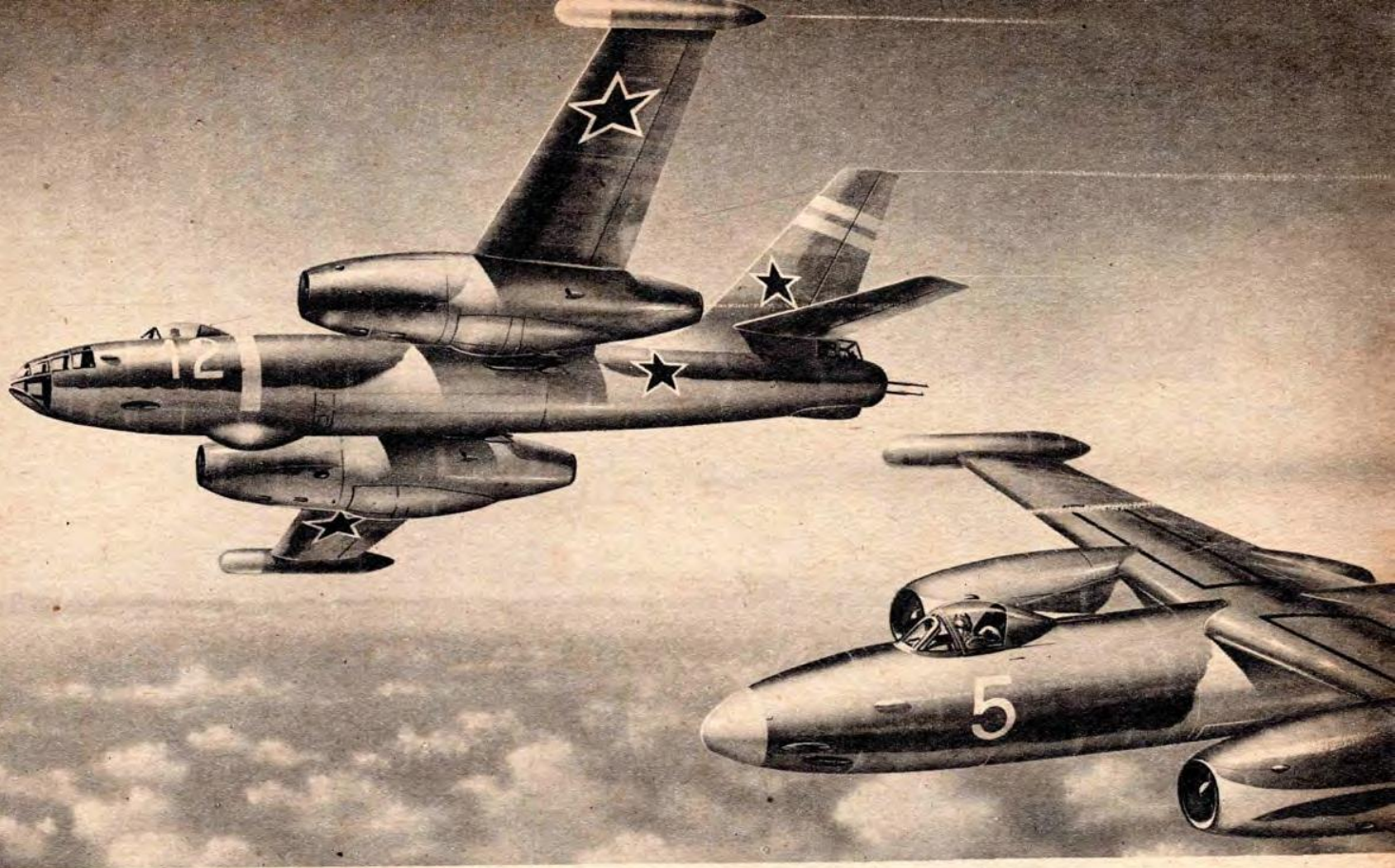
The Tu-4's *normal* operational radius is unlikely to exceed 2,000 miles—insufficient to meet the ADD's trans-polar requirements—but the successful development of in-flight refueling techniques has eased the immediate problem facing Soviet planners for, with recourse to this system, the ADD *can* attack North American cities with its *present* Tu-4 bomber equipment. In-flight refueling trials were first undertaken in Russia in 1946, and this equipment, based on that development by the British, is now a standard fitment of Tu-4 bombers of the strategic striking force. Of the 900-plus Tu-4s based in the Arctic belt, one in five is a tanker aircraft, two attached to each squadron.

Refinements have brought late production Tu-4s into the B-50 category; the 2,100 hp ASH-90 radials (direct copies of the Wright R-3350) have been replaced by M-300 radials designed by Arkadii Shvetsov and giving upwards of 3,200 hp each, overload fuel tanks have been slung outboard of the engine nacelles, and armament and tail surfaces have been revised.

Russia's global bomber destined to replace the Tu-4 with ADD formations and referred to by Western intelligence under the code designation *Type 31*, is known to

All-weather fighter designed by A. J. Mikoyan. Span, 41'; length, 43'. The two-seater was spotted in the skies over Eastern Germany.





Two variants of the Il-28. In background is the attack bomber and in foreground the night fighter version with closed, radar-equipped nose.

have commenced flight trials during 1951. A pre-production batch of ten-fifteen machines is undergoing service evaluation, but *Type 31* will not be available in quantity *much before 1954*. Power plants are reported as turbo-props derived from German wartime designs, plus jet pods for take-off and combat boost. Cruising speed is believed to be of the order of 450-470 mph, and maximum range, 8,000 miles.

To counter the threat of attack by our own Strategic Air Command, the Reds have placed emphasis on the evolution of a closely knit air defense network embracing all Russia's strategic centers. Known as the *Protivovozdushnaya Oborona*, or PCO, the defense forces, like the ADD, wield a certain amount of autonomy. The PVO is responsible for the continental and metropolitan early warning chains, the anti-aircraft artillery, and large interceptor fighter formations.

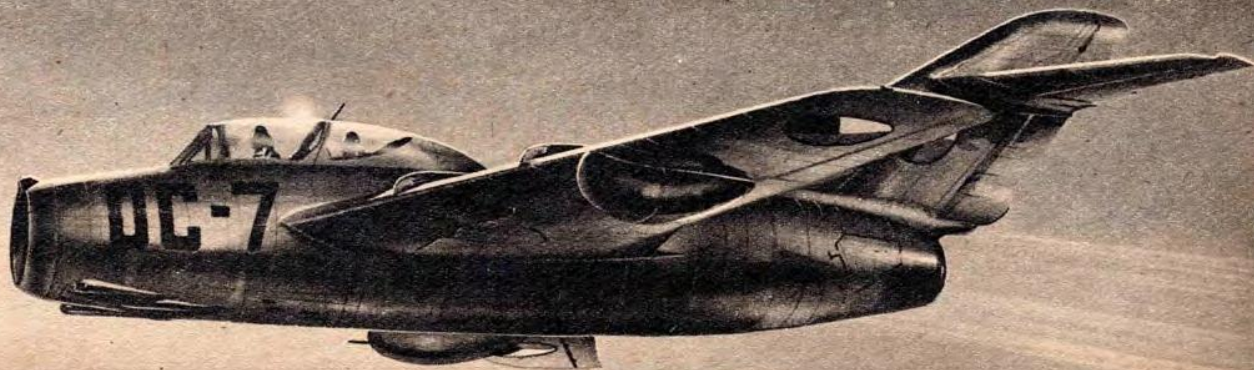
Commanded by the Premier's son, General-Major

Vasilli Stalin, the PVO fighter pilots are considered the elite of the Soviet Air Fleet, and the equipment requirements of the PVO are given the very highest priority. With the polar concept of air warfare always uppermost in mind, the Russians have positioned the largest PVO interceptor formations at an arc of airfields across the Arctic belt as a barrier against attack from Alaska.

The Soviet radar screens as yet cover only some of the approaches to industrial centers, but the high standard of Russian early warning and GCI radar has already won the respect of U. N. forces in Korea, as have the radar searchlight and anti-aircraft artillery control.

The majority of the day interceptor forces of the PVO, and, for that matter, the Soviet Air Fleet as a whole, are MiG-15 equipped, although northern-based PVO units reportedly use the longer-ranging and faster Lavochkin La-17 which is now known to be fitted with an afterburner. Certain La-17- (Continued on page 58)

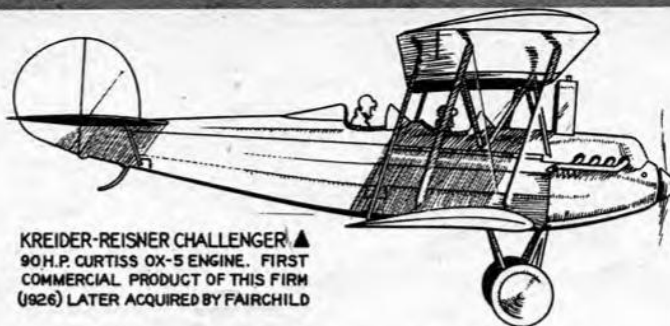
Trainer version of the famous MiG-15 designated as U-MiG-15. Widely used by Soviet AF. It is seen here in Czechoslovakian AF insignias.





# AIR PROGRESS

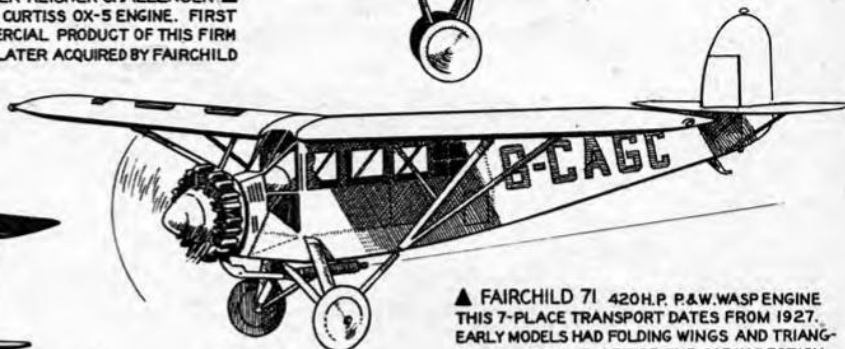
By DOUGLAS ROLFE



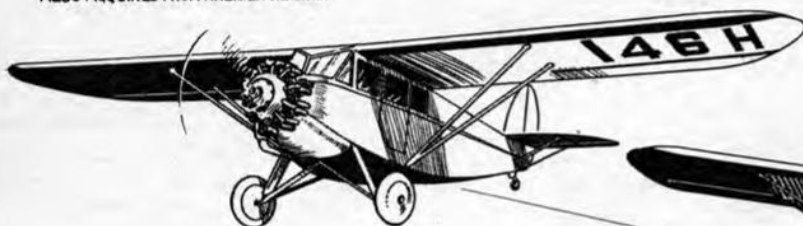
▲ KREIDER-REISNER CHALLENGER ▲  
90 H.P. CURTISS OX-5 ENGINE. FIRST  
COMMERCIAL PRODUCT OF THIS FIRM  
(1926) LATER ACQUIRED BY FAIRCHILD



FAIRCHILD KR.21 90 H.P. KINNER ▲  
ENGINE. 2-PLACE SPORTS TRAINER.  
ALSO ACQUIRED FROM KREIDER-REISNER



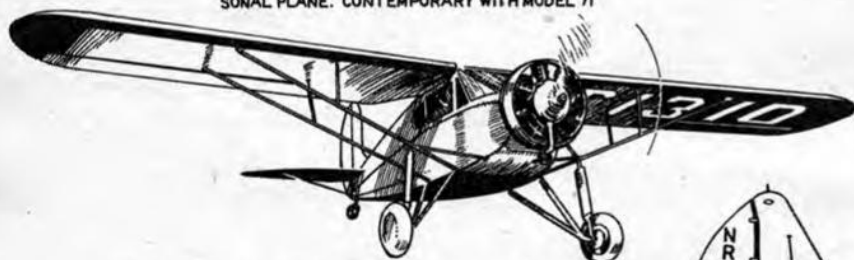
▲ FAIRCHILD 71 420 H.P. P&W WASP ENGINE  
THIS 7-PLACE TRANSPORT DATES FROM 1927.  
EARLY MODELS HAD FOLDING WINGS AND TRIANG-  
ULAR FUSELAGE AFT OF THE CABIN SECTION



▲ FAIRCHILD F.42 300 H.P. WRIGHT J-6 ENGINE  
FIRST FAIRCHILD APPROACH TO THE 4-PLACE PER-  
SONAL PLANE. CONTEMPORARY WITH MODEL 71



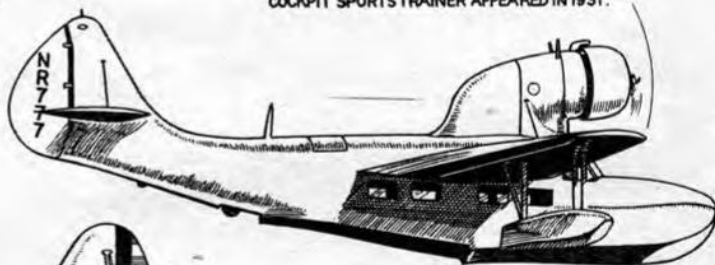
FAIRCHILD F.21 80 H.P. SIDDELEY ▲  
GENET ENGINE (1929) FIRST FAIRCHILD  
LOW WING DESIGN AND ANCESTOR OF  
THE FAMED WORLD WAR 2. MODEL M-62



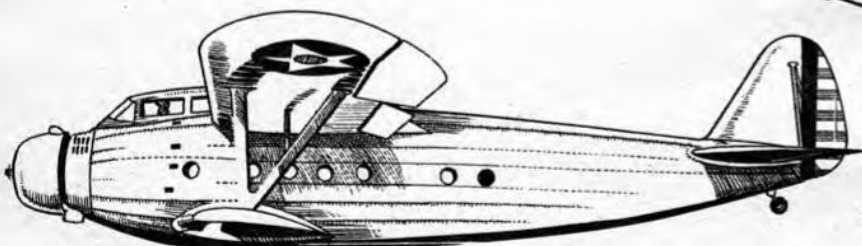
FAIRCHILD F-24 125 H.P. WARNER SCARAB ENGINE ▲  
PROTOTYPE OF THE EXISTING MODEL F.24 THIS WAS A  
TWO-PLACE AIRPLANE WHEN IT FIRST APPEARED (1932)



▲ FAIRCHILD F.22 75 H.P. 4-CYLINDER AIR-  
COOLED ROVER ENGINE. THIS 2-PLACE OPEN  
COCKPIT SPORTS TRAINER APPEARED IN 1931.

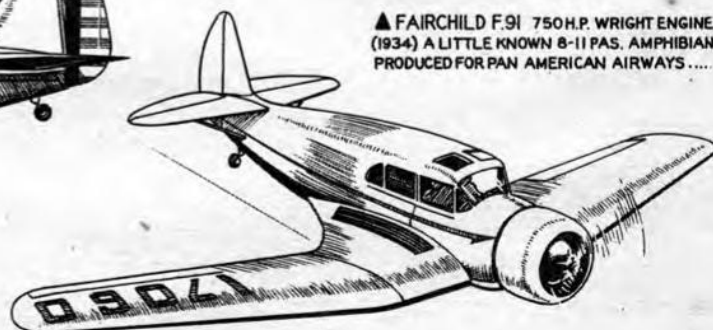


▲ FAIRCHILD F.91 750 H.P. WRIGHT ENGINE  
(1934) A LITTLE KNOWN 8-11 PAS. AMPHIBIAN  
PRODUCED FOR PAN AMERICAN AIRWAYS.....



FAIRCHILD KR.XC.941 (C-31) 750 H.P. WRIGHT ENGINE (1934) FIRST ▲  
FAIRCHILD DEVELOPMENT IN THE MILITARY CARGO AND TRANSPORT LINE

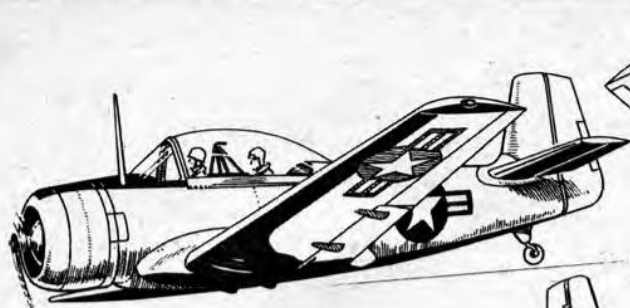
FAIRCHILD F.45 350 H.P. WRIGHT WHIRLWIND ENGINE (1935). THIS 5-  
PLACE PERSONAL PLANE PRODUCED 18 YEARS AGO CRUISED AT 155-60 MPH  
AND COMPARES FAVORABLY WITH THE BEST IN THIS CLASS BUILT IN 1952



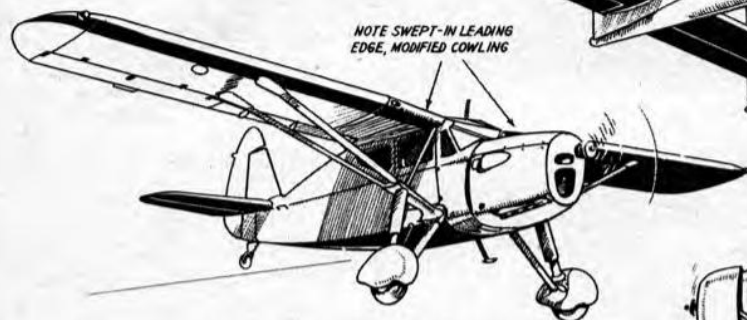
**THE FAIRCHILD STORY.** The Fairchild company started out as the Fairchild Aerial Surveys back in 1923, manufacturing aerial cameras and conducting extensive aerial surveys. Unable to find a suitable aircraft to fly cameras, its founder, Sherman Fairchild, formed the Fairchild Aviation Co., at Farmingdale, L. I., where the first truly camera planes, the

FC-1s, were designed and manufactured. So successful were these aircraft that subsequent improved versions, with more powerful engines, the FC-2 and model 71, played an important part in the development of the aerial transportation system in this country as well as in Canada and South America.



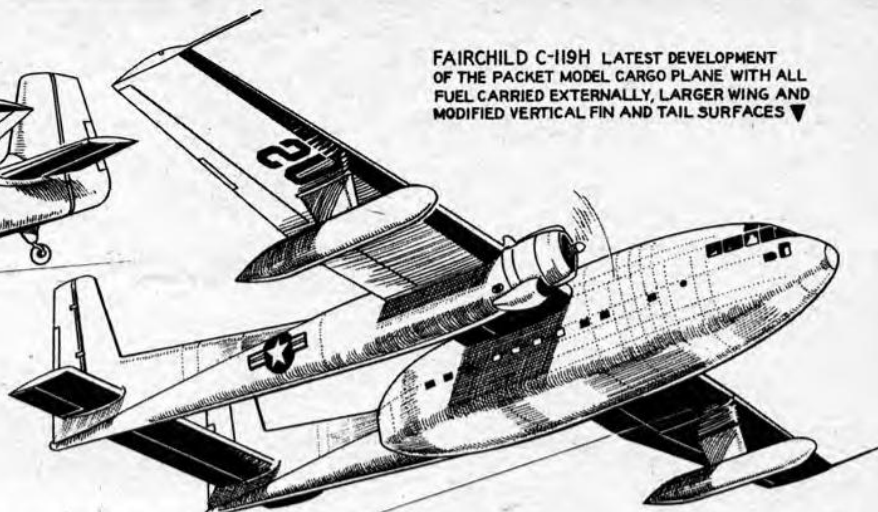


FAIRCHILD T-31 280 H.P. LYCOMING ▲  
ENGINE. A POST-WAR MILITARY TRAINER

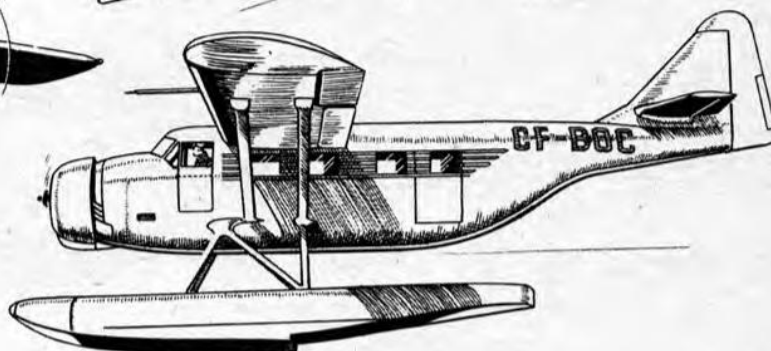


NOTE SWEEP-IN LEADING  
EDGE, MODIFIED COWLING

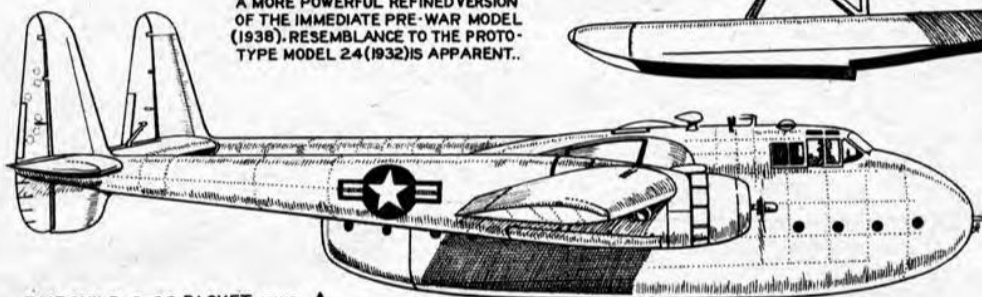
FAIRCHILD F-24 (POST-WAR) ▲  
200 H.P. 6-IN-LINE RANGER ENGINE.  
A MORE POWERFUL REFINED VERSION  
OF THE IMMEDIATE PRE-WAR MODEL  
(1938). RESEMBLANCE TO THE PROTO-  
TYPE MODEL 24 (1932) IS APPARENT.



FAIRCHILD C-119H LATEST DEVELOPMENT  
OF THE PACKET MODEL CARGO PLANE WITH ALL  
FUEL CARRIED EXTERNALLY, LARGER WING AND  
MODIFIED VERTICAL FIN AND TAIL SURFACES ▼



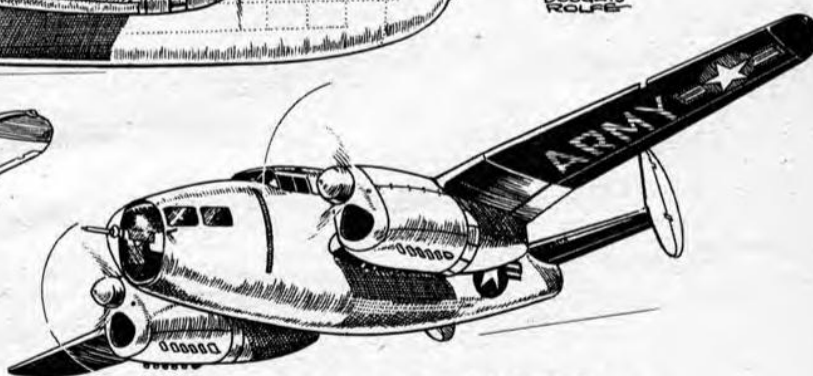
▲ FAIRCHILD F-11 HUSKY 450 H.P.  
WASP JR. ENGINE. CANADIAN BUILT 8-11  
PASSENGER COMMERCIAL TRANSPORT



FAIRCHILD C-82 PACKET TWO ▲  
2100 H.P. P & W RADIAL ENGINES. PROTO-  
TYPE OF PRESENT-DAY C-119 PACKET



▲ FAIRCHILD PT-26 200 H.P. 6-IN-  
LINE RANGER ENGINE. CANADIAN BUILT  
MODIFICATION OF THE PT-19 TRAINER



▲ FAIRCHILD AT-21 GUNNER TWO 520 H.P. 12-  
CYL. RANGER ENGINES. A WORLD WAR 2 TYPE AND  
PRODUCED BY THE DURAMOLD METHOD FROM WOOD

FAIRCHILD M-62A (AIR FORCE DESIGNATION PT-19  
CORNELL). 175 H.P. 6-IN-LINE RANGER ENGINE. THIS  
WAS MOST WIDELY USED U.S. TRAINER IN W.W. 2 ▼



▲ FAIRCHILD F-24 (PRE-WAR) 165 H.P. 6-IN-  
LINE RANGER OR 145 H.P. WARNER RADIAL EN-  
GINE. 4-PASS. DEVELOPMENT OF 1932 MODEL



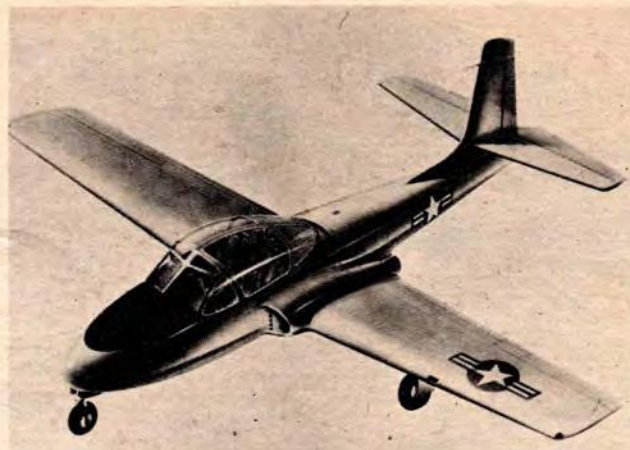
Almost from the beginning the name Fairchild has been linked with not only planes but precision instruments, dependable aircraft engines and high quality aerial cameras.

In 1938 the Fairchild Company, foreseeing the need for a simple but practical military trainer, submitted the design of the M-62A model to

the U.S. Army Air Forces. Under various labels, such as the PT-19 and PT-26, this airplane became one of the best known World War II Allied trainers, and apart from its excellence as an airplane had the great virtue of lending itself to rapid mass production. Wings were manufactured by means of the "Duramold" process, a Fairchild development. 23



# NEW MARTIN ROCKET



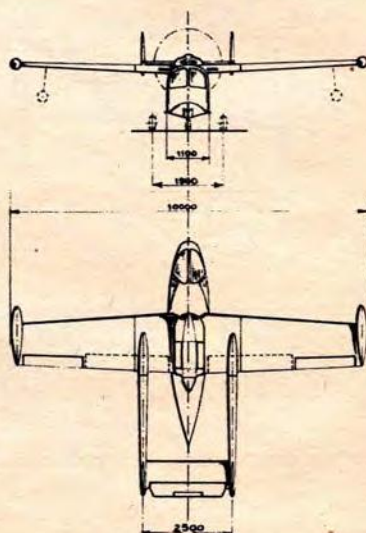
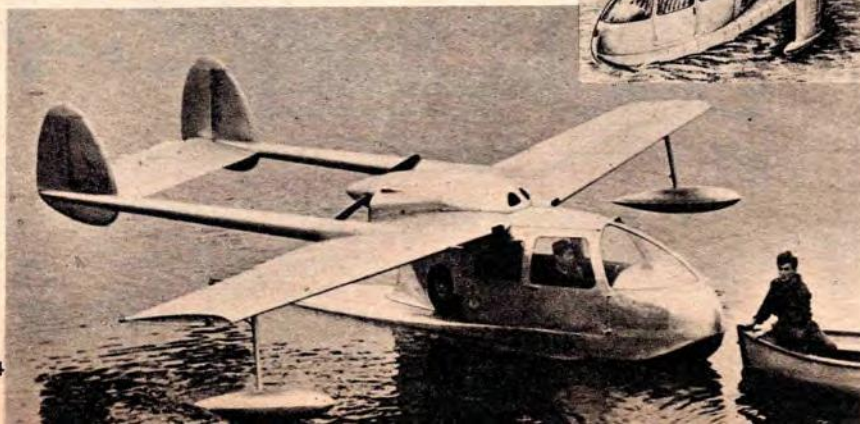
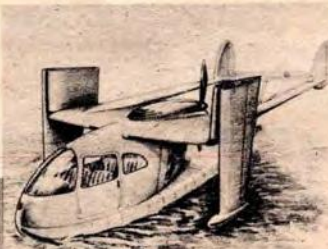
First American light jet trainer, the Cessna 318 which won AF design competition for jet primary trainers. Powered by two Turbomeca Marbores of 900 lb. thrust each. Span is 33 feet. Top speed around 400 mph.



Cessna 310, light, twin-engine personal transport. Of all-metal construction, it carries four passengers and a pilot. All fuel is located in two wingtip tanks, not only adding safety but permitting a very clean design: the wing space usually occupied by tanks houses the main landing gear, hence the engine nacelles could be made smaller and flatter. The engines are two 225 hp Continentals; span 36' 1".

Martin Viking No. 9, research rocket. An improved version of Glenn L. Martin Co.'s high-altitude vehicle, Number 9 is some six feet shorter and of larger diameter. Most recognizable features are smaller triangular fins. Powered by 20,000 lb. thrust Reaction Motors liquid engine. At a recent launching at White Sands, N. M., reached altitude 135.6 miles, equaling previous altitude record for single-stage rockets.

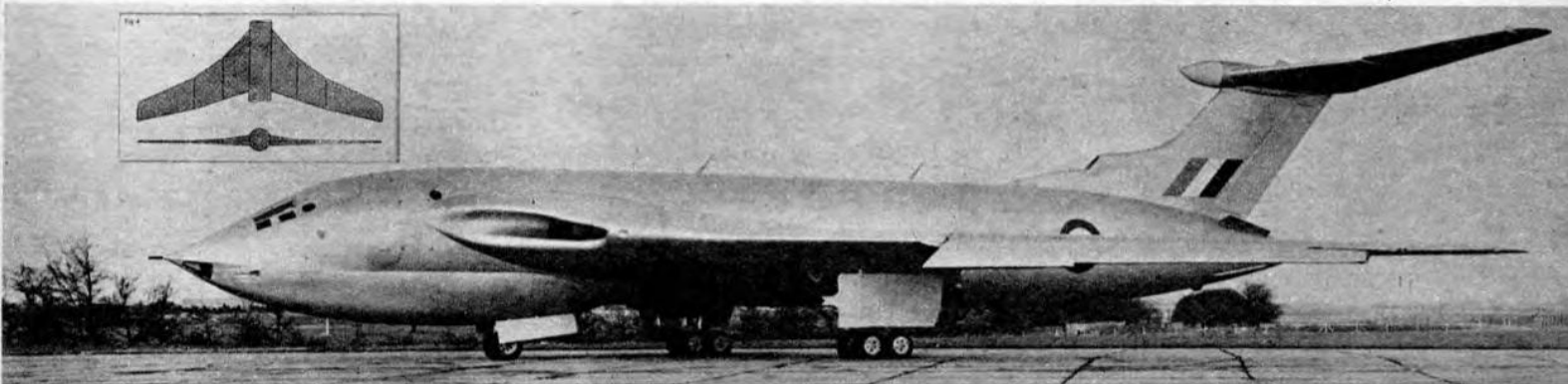
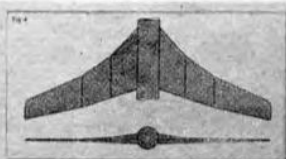
Nardi FN-333, a new Italian 3-place all-metal amphibian, to act as military liaison plane and as light personal transport. An unusual feature of the craft is the folding wings for taxiing through narrow areas and hanging in boat houses. Shown here is the prototype powered by a 145 hp Continental. Another model will have a 225 hp engine.





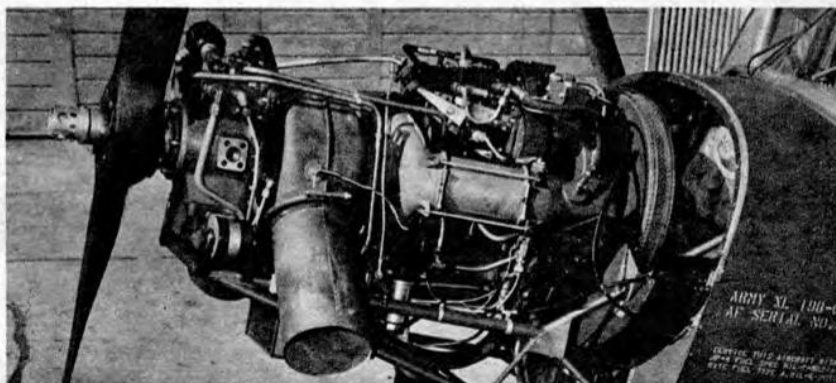
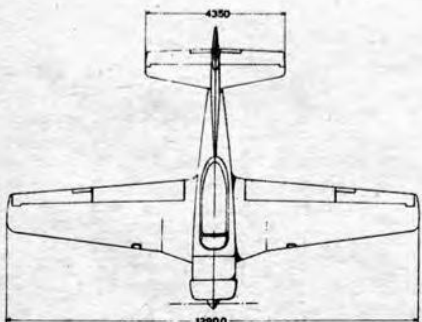
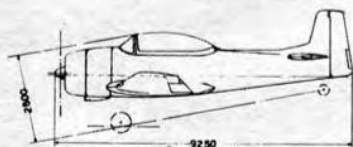
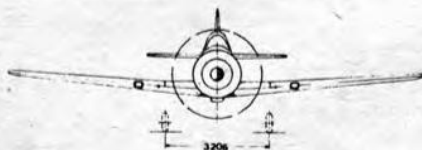


Latest newcomer to Cessna's highly successful line of single-engine airplanes is this model 180. The plane is equipped with a constant speed propeller driven by a 225 hp Continental engine giving it a cruising speed of 150 mph. The 180 seats four, has a luggage capacity of 120 lbs. Other features: "para-lift" flaps which reduce landing speed by 10%, are effective for short field take-off. Range is 4½ hrs.



England's latest jet bomber, the Handley Page H.P. 80 featuring the radical crescent or scimitar wing. This shape combines advantages of both the swept and thin straight wing at high subsonic speed and high altitude, and gives good control at low altitudes. Because of greatly reduced drag better fuel economy is achieved and the range is extended. The H.P. 80 is powered by four Sapphires of 8200 lb. thrust each.

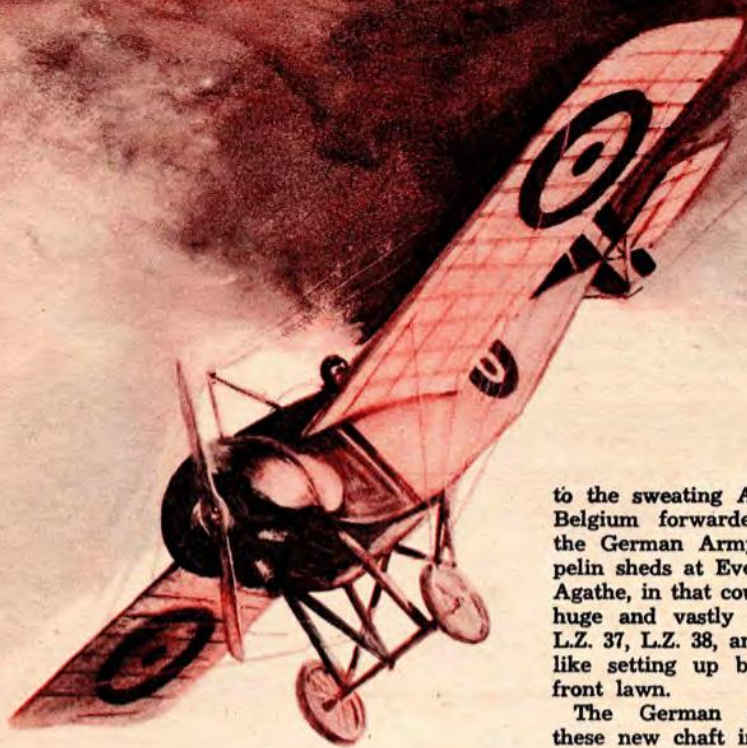
Below: Piaggio P-150, new Italian advanced trainer, shown here in three-view and photo, lower right, is somewhat reminiscent of the North American T-6. Powered by same type engine, 600 hp P&W R-1340. Span is 42 ft. 4 in., 237 mph tops, ceil. 25,200 ft., range 800 mi.



Experimental Boeing turboprop engine installation in a Cessna Bird Dog military liaison plane. Craft has designation of XL-19B. Powerplant develops 210 hp, weighs only 250 lbs., or 125 lbs. lighter than the conventional 212 hp engine of the standard L-19A. Because of the reduction in weight, the XL-19B has a very rapid and steep climb. The Boeing 502-8 turbine has been tested, in the last few years, in a variety of vehicles such as large trucks and Navy power boats, also as auxiliary powerplant, all with such good results that great changes portend.







**With a pistol, a carbine and six tiny bombs, a valiant Royal Navy pilot sets out to battle the Kaiser's giant Zeps**

**By DONALD NAUGHTON**

■ This was no weekend war; it was a titanic affair of clashing giants, a war of survival. And Britain and her allies were starkly aware of it, back in bleak, early 1915. The pressure was on. Powerful, superbly trained troops of the German Imperial Army probed relentlessly at the wall of the Western Front, while German submarines prowled the Channel and the North Sea in a savage war of blockade.

Not content to rest on their land and sea efforts, the Jerries attacked through a new sphere: they hurled their Zeppelins into Allied skies. Capable of hauling huge loads of explosives for long distances at high altitudes, these flying leviathans were perfect weapons with which to smash at the sources of supply and to strike at civilian morale.

The first raid of the Zeps, though sudden, was clumsy and feeble. On the night of January 19, two Naval Zeps, the L. 3 and L. 4, blundered in over Norfolk and discharged their bomb loads. For the first time in history, bombs fell on the British homeland. They did little material damage, but four civilians died swiftly.

Additional raids, stronger and more cleverly executed, continued at intervals and public indignation soared at the inability of the Admiralty, charged with air defense, to contend with the menace. In April, more woe was added

to the sweating Admiralty: agents in Belgium forwarded information that the German Army had erected Zeppelin sheds at Evere and Berchem St. Agathe, in that country, to house three huge and vastly improved Zeps, the L.Z. 37, L.Z. 38, and L.Z. 39. This was like setting up business on Britain's front lawn.

The German commanders tested these new chaff in a few skirmishing raids on England and then, on the night of May 31, the L.Z. 38 loomed high in the dark reaches above London and dropped over a ton of bombs on the sprawling metropolis in its baptismal bombing. And then it casually slipped away from the city's puny defense system, unseen.

The nation promptly roared its protest at the Admiralty. The theory of invulnerability that was slowly surrounding these extended gas bags threatened to have a serious effect on the war effort.

Tucked away in a corner, across the Channel, at Dunkirk, was No. 1 Squadron, Royal Naval Air Service. No. 1, equipped with an assortment of Avros, Moranes, Farmans and Bristols, low-powered, unarmed (of course!) delicate planes of that era, engaged mainly in reconnaissance duties (the specialized armed fighter, bomber and reconnaissance squadrons had not yet evolved). It also served as an outpost to warn of the approach of the Britain-bound Zeps.

The Zeps challenged the pilots of No. 1, intrigued them. They were unanimous in their desire to knock the huge aircraft out of the sky, but somewhat puzzled as to how this little feat could be accomplished. With no precedent to guide them, they set about the task with what makeshift devices and means they had at their disposal.

They got in their first licks on May 17. At 3 a.m., the L.Z. 39 was spotted off Dunkirk, knifing eastward. Two

patrol planes of No. 1 were already aloft; seven more immediately took off to join them. Squadron Commander Spenser Grey and Flight Sub-lieutenant Reginald Warneford, armed with carbines, succeeded in closing in on the massive dirigible and were able to exchange a few shots with her before she nosed upward and easily outclimbed them.

Another squadron member, Flight Commander A. W. Bigsworth, subsequently encountered her and trailed her all the way to Ostend. The L.Z. 39 was pushing along at 10,000 feet, but by dint of skillful piloting, Bigsworth bullied his laboring 80 hp Avro to an altitude 200 feet above her massive length. He quickly released the four 20-lb. bombs his plane carried and dived away. Though she staggered under the impact of the explosives and smoke plumed from her stern, the huge craft continued to hold to her course and sailed steadily homeward, to Bigsworth's complete disgust. She reached her shed at Evere safely with one officer dead, several enlisted men wounded, and some slight hull damage.

No further opportunity for No. 1 to lock with the Zeps came until June 7, a day which was to be eventful in sky warfare. In the opening minutes of that day, Squadron Commander Grey stood in the darkness and gave final instructions to four pilots he had selected for a special mission. Flight Lieutenant J. P. Wilson and Flight Sub-lieutenant J. S. Mills, flying Farmans, were to attack the Zeppelin sheds at Evere; Flight Sub-lieutenant Warneford and another pilot (history does not record his name), flying Morane monoplanes, were directed to work over the sheds at Berchem St. Agathe.

Strangely, there now occurred one of those freakish incidents that leave so much to chance in any man's war. As the British pilots took off to bomb

# Death at Dawn for the L.Z. 37



the Army Zepps in their cradles, the same Zepps took off to join a flight of Naval Zepps at a rendezvous over France; the combined group was then to proceed to its target—England. The wheel of fate continued to turn, however. The L.Z. 38 developed engine trouble soon after take-off and returned to its shed at Evere. The remaining two military Zepps, the L.Z. 37 and the L.Z. 39, ran into fog, wandered about aimlessly, missed the rendezvous and finally nosed homeward.

Meanwhile, Wilson, too, encountered the fog, but he set a compass course and bored straight for Evere, arriving there shortly after 2 a.m. He was positive he was over his destination, but could see nothing in the inky blackness below. Then a searchlight beam suddenly stabbed up from the void and signaled a series of "longs," challenging him to identify himself. Wilson thought fast, thrust his Aldis lamp out of the cockpit, pointed it earthward, and obligingly snapped a series of "shorts." He grinned to himself as the great eye below promptly accepted him and winked out.

Easing down to 2,000 feet, he circled his Farman lazily for about fifteen minutes until the barest outlines of the Zeppelin shed began to emerge in the first pre-dawn light. And then he dived steeply; sweeping in over the target he cut loose the three 65-lb. bombs he carried and immediately glanced downward to observe the results.

The station came to life with a jolt. Almost at once anti-aircraft guns

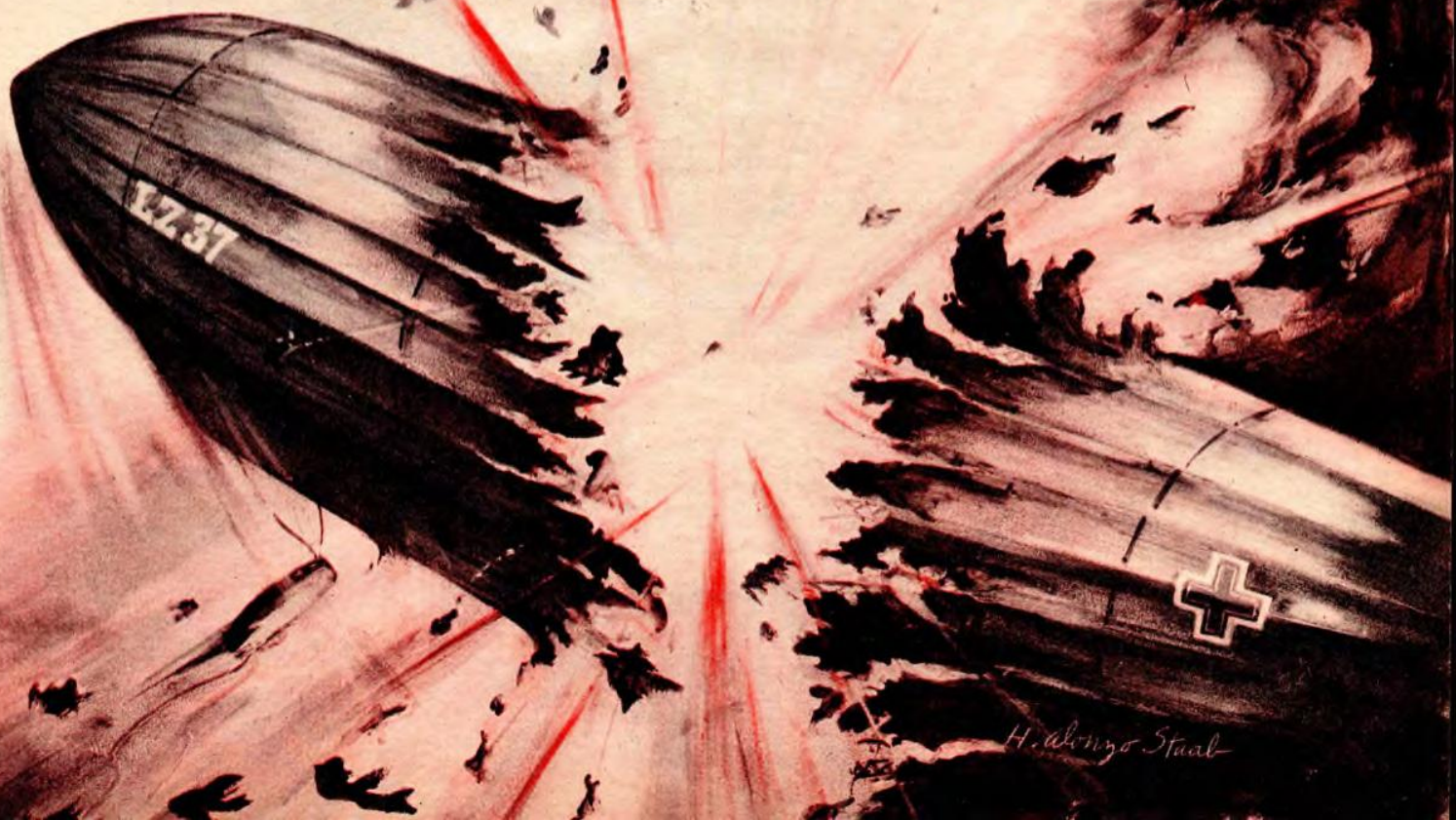
opened up. He was elated to see pillars of smoke streaming from the shed, but a closer inspection failed to reveal the tell-tale sign of flame. His raid had failed, he muttered angrily to himself as he ruddered his craft away from the hail of fire leaping skyward.

His companion, Flight Sub-lieutenant Mills, innocently wandered in over the shed about ten minutes later and was immediately surrounded by flying lead. Mills whipped away, climbed to 5,000 feet, and returned at top speed. Over the shed he dropped his four 20-lb. bombs. A few seconds later, artificial daylight suddenly illuminated the scene below as the bombs bull's-eyed through the roof of the shed and disintegrated the L.Z. 38 in a tremendous burst of flying flame and smoke that could be seen for miles.

Mills didn't wait for a second look; he kept right on going. He ran into fog and several hours later landed on the beach between Calais and Dunkirk. Wilson, incidentally, roamed around in the same fog and landed safely at Boulogne, after spending a total of five hours in the air!

While these two had been putting on a show for the Jerries at Evere, Flight-lieutenant Warneford and his companion were occupied with their own problems. The latter pilot had foul luck; his instrument lights failed, he promptly got lost, and at last crash-landed near Cassel. He escaped injury.

Warneford, flying toward his destination, the sheds at Berchem St. Agathe, was calmly appraising his chances for a (Continued on page 62)





MAY 1953 / 35 CENTS

# Air Trails

Aviation  
and  
**MODEL  
PLANES**



**Exclusive: "I watched Wilbur fly!" • Reds' U-MiG-15  
World's Fastest Class A • "Bartlett Bullet" team racer**



**Editor:** Albert L. Lewis. **Technical Editor:** Alexis Dawydoff. **Editorial Production:** Carl Happel. **Art Director:** W. F. Tyler. **Editorial Assistants:** Rose Borello, Barbara Grey. **Correspondents—Radio Models:** Howard McEntee; **West Coast Modeling:** Dick Everett.

**Cover:** Convair XF2Y Sea Dart. First delta wing seaplane fighter in the world. Equipped with retractable hydro-skis and 2 powerful jet engines. A number will be built for the U.S. Navy.



May, 1953 • Vol. 40, No. 2

### FOR THE READER

|                                |    |
|--------------------------------|----|
| AIR NOTES                      | 8  |
| R/C ROUNDUP                    | 10 |
| AIRMEN OF VISION               | 14 |
| DOUGLAS A3D                    | 16 |
| NOT MUCH TIME                  | 19 |
| RED ARMY CONTROLS SOVIET AIR   | 20 |
| FORCE—WILLIAM GREEN            |    |
| AIR PROGRESS: AERONCA STORY    | 22 |
| —DOUGLAS ROLFE                 |    |
| I WATCHED WILBUR FLY           | 24 |
| —HARRY HARPER                  |    |
| SWEET SIXTEENTH                | 26 |
| —AUBREY "RED" KOCHMAN          |    |
| WORLD'S FASTEST "A"            | 28 |
| —SGT. GEORGE A. MUELLER        |    |
| BARTLETT BULLET                | 32 |
| —WARREN E. BARTLETT            |    |
| "MAC II": HI-POWER 5 WATT      | 34 |
| TRANSMITTER—HOWARD MCENTEE     |    |
| SASSY SAUCER—GEORGE HARRIS     | 36 |
| RUSSIAN U-MIG-15 IN THREE-VIEW | 38 |
| LIBERTY BELLE—D. SCHUMACHER    | 39 |
| K&B'S FREE FLIGHT KIWI         | 44 |
| ENTERPRISE'S SLICK CHICK C/L   | 44 |
| MONOGRAM'S THUNDERBOLT         | 45 |
| BERKELEY'S F/S HELIOPLANE      | 45 |
| OUT TO LAUNCH                  | 46 |
| MOTOR OF MONTH: ATWOOD         | 48 |
| CIVIL AIR PATROL               | 52 |
| DOPE CAN—THE DOPESTER          | 54 |
| WESTERN ROUNDUP                | 56 |
| SKETCHBOOK—DRAWINGS BY THOMAS  | 66 |
| MACNABB ON R/C DESIGN DETAILS  | 68 |
| SHOWCASE: MODEL MEN            | 74 |
| CONTEST CALENDAR               | 77 |

### STREET & SMITH PUBLICATIONS, INC.

President.....Gerald H. Smith  
Executive Vice President.....Ralph R. Whittaker, Jr.  
Vice President and Secretary.....Arthur P. Lawler  
Treasurer.....Thomas H. Kaiser

Walter J. McBride, Advertising Mgr., 575 Madison Ave., New York 22; Frank C. Smith, Mid-Western Adv. Mgr., 230 No. Michigan Ave., Chicago 1; West Coast Advertising Representative, Kimball, Menne Co., 2550 Beverly Blvd., Los Angeles 4, Calif., and 681 Market St., San Francisco 5, Calif.

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright, 1953, by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention, 35c per copy. This issue is Vol. XL, No. 2. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

### FROM THE READER

**G.E. Clarifies Gunsight Item . . .** This is to clarify a misconception established by your article "No Time To Kill!" appearing on page 29 of Air Trails magazine of January 1953. This article covers the A-1 gunsight and the AN/APG-30 radar equipment that together form the fighting equipment used in several of our fighter aircraft in Korea. I wish to clarify, however, the function of the radar equipment in this sighting system and also its development and manufacture. The radar is employed to deliver range information only to the gunsight which then solves the ballistics problem and gives the pilot his aiming points. The radar does not supply search information to detect "unseen" enemies nor was it developed or manufactured by the Sperry Gyroscope Company.

The fire control system referenced in your article is a true result of service coordination. The Air Force supported the gunsighting equipment, i.e., that portion developed by Dr. Charles S. Draper and produced by the Sperry Gyroscope Company. The Bureau of Aeronautics of the Navy Department supported the development and production of the radar which was performed by the Electronics Division of the General Electric Company. Both Services tested these equipments and exchanged data so that the optimum results and maximum standardization could be achieved. The General Electric Company is very proud of its contribution in the design and production of this radar set in that it has established itself well in operation as being rugged, reliable and accurate. W. F. Hafstrom, General Electric Company Electronics Park, Syracuse, N. Y.

**Eligible for "Caterpillars" . . .** I would like to get information on the "Caterpillar Club." I became entitled to membership on 1 March, 1952 by bailing out of a crippled C-45 over Goshen, N. Y. By sending me the present address of the club or of a company which will give me the membership card and "Caterpillar" pin, you will add another name to your list of satisfied readers.

A/2c Francis X. Callahan, Korea

• The address of the Caterpillar Club is P.O. Box 1328, Trenton, New Jersey.

We are taking the liberty of sending your letter to the Club, which, undoubtedly, will expedite matters. In the meantime, we suggest that you write to them anyhow, giving them the background history of your jump, as well as type of chute used.

**Meaning of Aspect Ratio . . .** I would like to know the meaning of "aspect ratio."

Jerry Vogt, Seward, Neb.

• Aspect ratio is the ratio of a plane's wing span (length of wing) to its chord

(width). Thus, if the wing is 35 ft. long and 5 ft. wide the aspect ratio will be 35 divided by 5, which equals 7. Seven is then the aspect ratio of this plane's wing.

**Similarity in Sketchbook Ideas . . .** About two months ago I sent you a new design about a double throw bellcrank. I sent it by registered letter and got word by mail you got it. In my December '52 issue I saw a bellcrank in the Sketchbook just like the one I sent in, except it was modified. I sent the real one in. Do I get any credit?

Michael E. Theriot, Baton Rouge, La.

• It is not unusual for similar Sketchbook ideas to be suggested over a period of time by different individuals. It is the accepted practice, and one which we follow, to accept and give credit to the first which comes to our attention. Mr. Schneider's communication for Sketchbook reached us in August and was drawn up at that time. At no time was your sketch linked with Mr. Schneider's. The sketch which appeared on page 71 of our December issue is a faithful copy of what Mr. Schneider drew in Germany.

**Starting Time . . .** I just got finished reading your latest edition of Air Trails. It is a very wonderful book for young boys like myself. I am thirteen and hope to grow up to be a pilot.

John La Valla, Tacoma, Wash.

**His Engine Failed . . .** I would appreciate your opinion as to the most likely cause of a recent engine failure. The aircraft was lost at sea.

I had been cruising on a steady course in an Ercoupe at an altitude of 1500 feet, airspeed 85 mph, for half an hour. It was a clear day, the air temperature was about 75 deg. Fahrenheit. Suddenly the engine began sputtering and missing. After about 30 seconds of this, it stopped entirely. There was sufficient fuel, no cut-off valves were shut, and switching magnetoes had no effect. Do you think there was any possibility of carburetor icing?

R. H. Pierce, San Francisco, Calif.

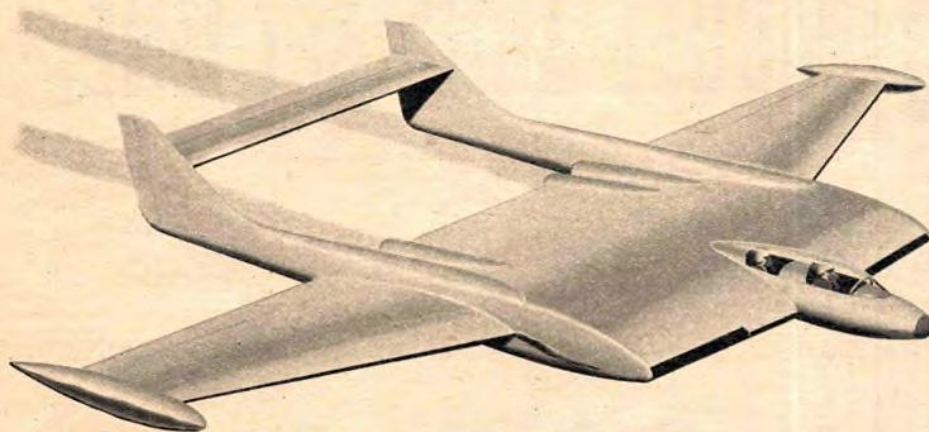
• It appears, from your description, that the engine failure was quite possibly due to carburetor ice, though the air temperature was high. Due to gasoline evaporation the temperature in the carburetor venturi drops to freezing and if moisture content of the air is just right ice is apt to form. Best procedure whenever the engine sputters for an unknown reason is to put on full carburetor heat immediately.

**Suggestion from "Brasil" . . .** I have a suggestion for the diesel owners in U. S. A. I think that the fuel they use contains castor oil and paraffin oil. We here in South (Continued on page 12)

**All communications** to the editors should be addressed to 304 East 45th St., New York 17, N. Y. **Subscription prices:** U. S. and Possessions—\$3.50 per year, \$6.00 for two years; Canada—\$4.00 per year, \$7.00 for two years; countries of the Pan American Union—\$7.00 per year, \$10.00 for two years; elsewhere—\$10.00 per year, \$14.00 for two years. **Please advise us if you move,** giving old address and new address; allow four weeks for change of address; address all subscription mail to **Air Trails Subscription Department**, 304 East 45th St., New York 17, N. Y.



# AIRMEN OF VISION DESIGN COMPETITION



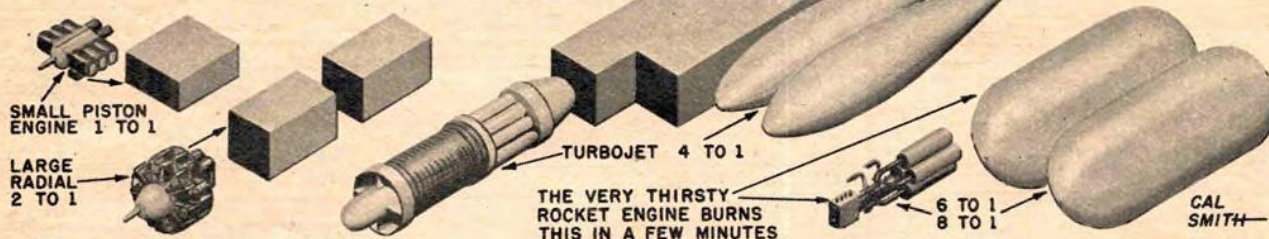
## 1<sup>ST</sup> Prize-Winning Design

Best design this month is torpedo bomber by Air Force Staff Sergeant Robert Wolcott, currently overseas, based on Burnelli lifting fuselage design. Some redesign was made by AT technical staff, relocating crew to center pod for better visibility and intercommunication from prior position in left and right side of fuselage. All military load is stowed in fuselage and released from large bomb bay. Recoiless 75-mm and two 20-mm cannon.

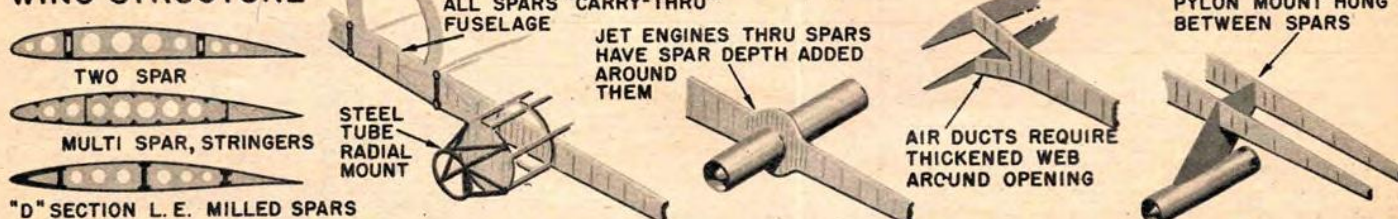
**REMEMBER**—fuel space is at a premium. When laying out wing design, try to visualize the basic structure inside. Landing gear types are pretty standardized with forged oleo struts used in most retractable gear. Allow room for extended position. Shown also

are fixed gear for smaller craft. Small plane floats are the EDO design. Large flying boat hulls have large length-beam ratio and this design should be used on big subsonic boats. The hydro-ski, permitting thinner hull, will make fast, heavy types practical.

### FUEL SPACE SHOWN IN RATIO TO ENGINE SPACE



### WING STRUCTURE



### LANDING GEAR



### FLOATS & HULLS



Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



All-weather MiG-15F fighter, already in wide use by Soviet Air Force, is radar-equipped, 2-seat version of standard MiG. Plane in same category as USAF's Lockheed F-94, though resembles F-86D. Undoubtedly in over-600mph class, "15F" is part of Russia's AF charged with western defense.

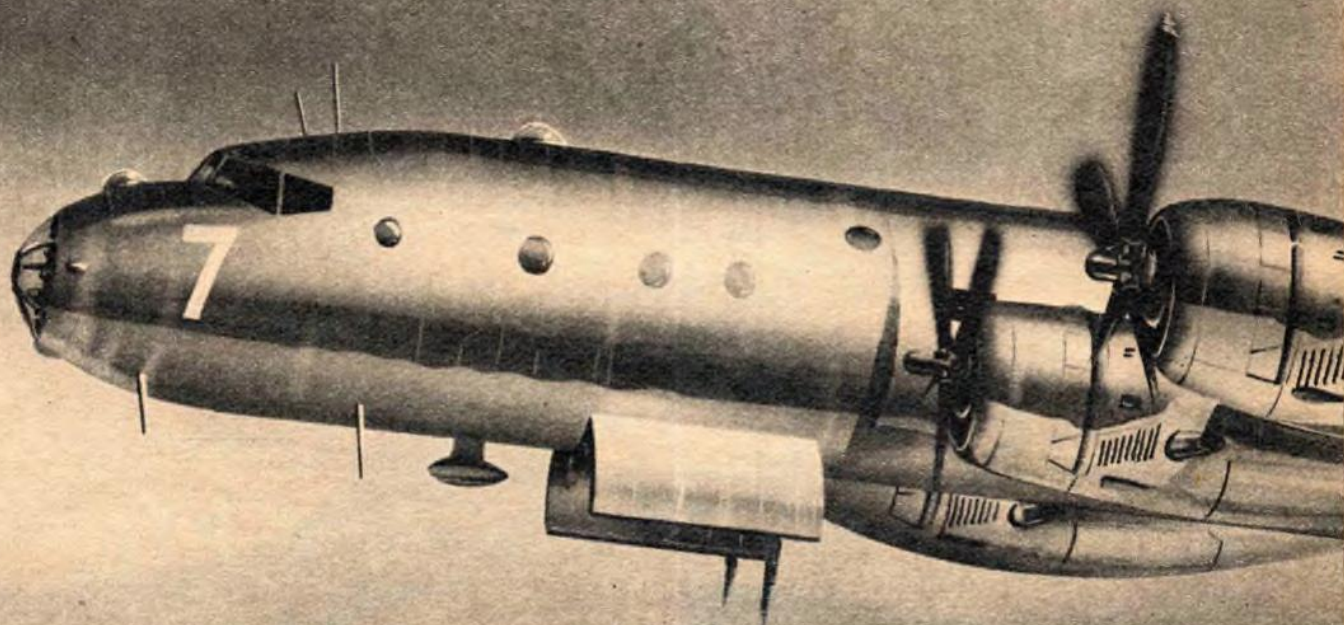
## Not much time

Quotes requiring no comment: "The U. S. Aircraft industry will turn out about 14,500 military airplanes this year but Russia's production will be even greater . . . it takes (us) from two to four years to get a new aircraft off the drawing board and onto the production line . . . air power is not a sometime thing."

MUNDY I. PEALE, President  
Republic Aviation Corporation

Three Soviet trainers:  
top, U-Yak-15 for jet indoctrination; center, Yak-18 primary that unlike most of kind has retractable landing gear; bottom, Yak-11 for basic work, equivalent to our T-6 trainer, but faster.





## Red Army Controls Soviet Air Force

In Part II of "The Red Air Force is Ready" we see how the masters of the land direct the soldiers of the air

Text by

**WILLIAM GREEN**

Illustrations by

**ROY CROSS**

■ The largest component of the highly organized and versatile complex of air forces comprising the *Sovietski Voenno-Vozdushni Flot* (Soviet military air fleet) is that formed by the vast numbers of combat airplanes committed to the direct support of the Army, absorbing some 70 percent of the total air strength of the Soviet Union.

The key to Russian military strength is the Army, but the Kremlinites realize that, despite its size, any land offensive launched by the Red Army would soon come to a halt if it lacked strong air support. Thus, the major proportion of the Soviet Air Fleet comes under direct Army control and is used almost solely as an instrument for the immediate support of the land forces.

This tactical support component of the SovAF comprises some twenty Air Armies; an Air Army being a rather loose organization, varying in the number of Air Divisions and regiments that it contains with the importance of the sector to which it is committed.

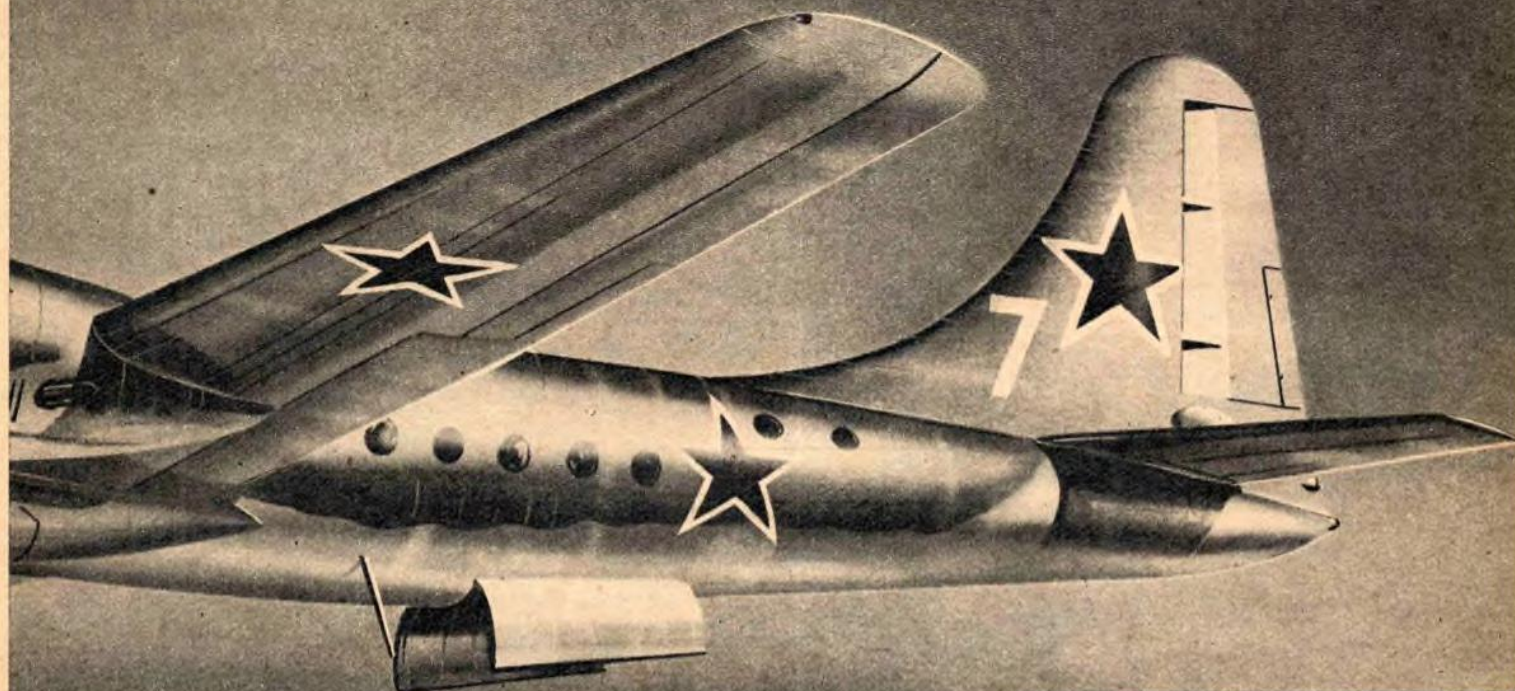
During World War II an Air Army varied in strength from 500 to 2,000 combat planes, according to the intensity of the air war in that particular area of the front and its rating on the list of supply priorities. An Air Division usually comprises three or four regiments, these in turn containing up to four squadrons of twelve airplanes each and corresponding roughly to a USAF wing.

The SovAF fighter regiments use the same airplane types as those used by the PVO home-defense elements, and the *Shturmovik* groups, which, until a few years ago favored slow, heavily armored planes, are for the most part equipped with twin-jet bombers in the weight/size category of the B-57A Canberra. These are also used for medium and high-altitude bombing attacks as part of the Soviet program of reducing the number of individual airplane types to which production is committed. The Reds have learned the lesson that a multiplicity of models not only hampers production but complicates maintenance and the supply of spares in a fast-moving campaign.

Two different twin-jet attack bombers are now available in considerable numbers to SovAF *Shturmovik* elements, the Ilyushin Il-28 (erroneously referred to in the past as Tu-10 and Il-26), and a machine referred to by Western air intelligence as the *Type 35* but also generally credited to Sergei Ilyushin's design team.

The Il-28 has become the "maid-of-all-work" of the SovAF, having been adapted to undertake the roles of night





Standard long-range military Tu-70 as paratroop transport with two large ventral dropping hatches.

intruder/patrol fighter, pilot conversion trainer, and coastal shipping attack as well as its basic task of short-range tactical bombing.

Power is furnished by two axial-flow turbojets in the 5-6,000 lb. thrust class which place top speed at sea level in the 550-570 mph bracket. Cruising speed is upwards of 470 mph, and operational ceiling 45,000 feet. Of comparable size, the other twin-jet attack bomber is believed to fulfill more closely the role of the wartime *Shturmovik*. A low-shoulder wing airplane spanning about 70 feet, the *Type 35* is a two/three seater with a circular-section fuselage and unswept wing and tail surfaces. The two large underslung turbojet nacelles contain centrifugal type RD-45 units of 6,000 lb. thrust, and although lacking much of the aerodynamic refinement of the B-57A, this airplane is believed to have a top speed close up to 600 mph. These jet bombers are to replace the remaining piston-engined Tu-2 and Tu-6 bombers during this year.

Transport airplanes figure prominently in SovAF equipment, and the commercial airlines, *Aeroflot*, *Aviaarktica*, and *Hamiata*, used for the most part aircraft that form standard SovAF equipment, thus offering a valuable reserve for the Army air transport elements.

The Il-12 and Li-2 (license-built DC-3) remain the standard medium-range transports of the SovAF and the airlines of the Soviet Union and her satellites. The two major variants of the Il-12 are the military version with

large double-entry cargo doors on the port rear fuselage and accommodating up to forty paratroops; and the other as a 24-32 passenger commercial airliner. The Il-12 is the Russian equivalent of the Convair 240, and a number of modifications have been made since its introduction, including the strengthening of the nosewheel leg, redesign of the engine cowlings, removal of the rubber de-icing boots on tail assembly leading edge, and the addition of more comprehensive radio navigational aids.

The Il-12 is also used as a glider tug and is frequently seen towing one or other of the two types of heavy freight and troop-carrying gliders that are used in considerable numbers by the SovAF. One of these, designed by Alexander Yakovlev, bears a strong resemblance to the British General Aircraft Hamilcar of wartime vintage. Spanning some 90 feet, it carries some thirty-five fully-equipped troops at towing speeds of 170 mph. The other glider, designed by P. V. Tsibin, carries twenty.

The standard long-range military transport is the Tu-70 (the designation is probably a factory-allotted type number). This transport, based on the Tu-4 bomber but featuring an entirely new fuselage with a step-down pilot's windscreen, carries some 110 fully-equipped paratroops. On trans-continental services inside Russia, it accommodates 72 passengers.

For liaison and ambulance duties, the Yak-14 lightplane in the Cessna Bird-dog category has largely replaced the ancient but (Continued on page 60)



Training version of the Il-28 attack bomber, the U-11-28. Service types include light bomber and ground attack.



Used both for military and civilian purposes, the Tsibin glider illustrated here belongs to the Aeroflot airline.



Soviet Air Force standard troop and cargo glider designed by Yakovlev. Span is 85 ft. Towed by Il-12 transports.



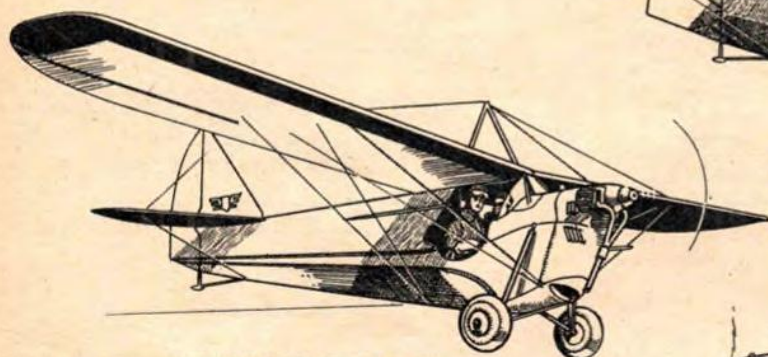
# AIR PROGRESS

By DOUGLAS ROLFE

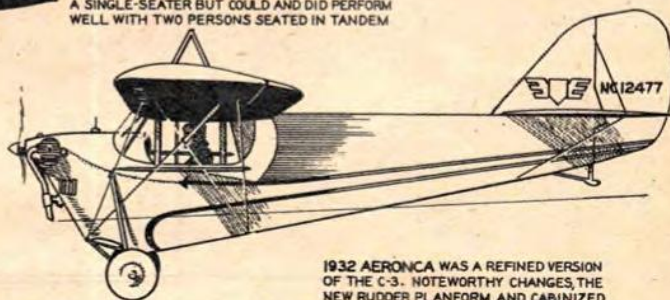
## The Aeronca Story



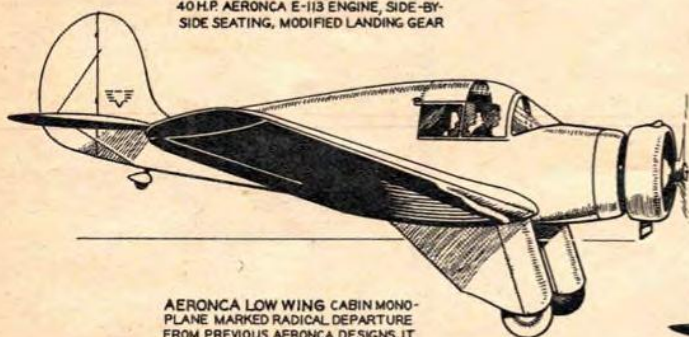
FIRST AERONCA APPEARED IN 1930 — IT RESEMBLED AND WAS PROBABLY INSPIRED BY THE 1923 BRITISH "WEE BEE". POWERED WITH A 28 H.P. AERONCA ENGINE IT WAS NOMINALLY A SINGLE-SEATER BUT COULD AND DID PERFORM WELL WITH TWO PERSONS SEATED IN TANDEM



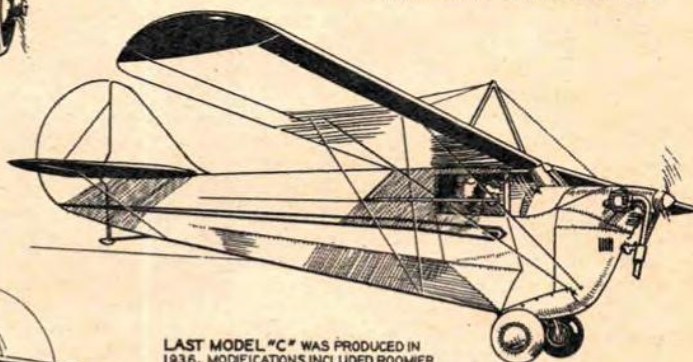
AERONCA C-3 FOLLOWED IN 1931; HAD 40 H.P. AERONCA E-113 ENGINE, SIDE-BY-SIDE SEATING, MODIFIED LANDING GEAR



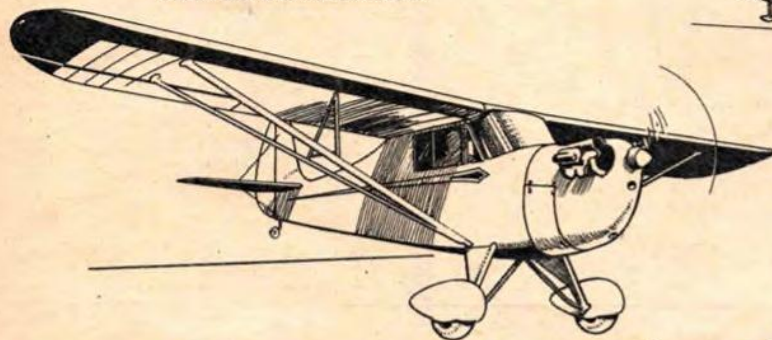
1932 AERONCA WAS A REFINED VERSION OF THE C-3. NOTEWORTHY CHANGES, THE NEW RUDDER PLANFORM AND CABINIZED COCKPIT—POWER PLANT SAME AS IN 1931 "C"



AERONCA LOW WING CABIN MONO-PLANE MARKED RADICAL DEPARTURE FROM PREVIOUS AERONCA DESIGNS. IT ANTICIPATED PRESENT DAY TREND IN PERSONAL PLANE DESIGN BUT ODDLY ENOUGH WAS NEVER DEVELOPED. (1936)



LAST MODEL "C" WAS PRODUCED IN 1936. MODIFICATIONS INCLUDED ROOMIER RECTANGULAR CABIN SECTION DIFFERENT RUDDER OUTLINE AND LANDING GEAR



AERONCA CHIEF SERIES ORIGINATED IN 1936 WITH THE ▲ MODEL 50 SHOWN HERE. VARIOUSLY POWERED WITH 50 H.P. ENGINES IT WAS A CONVENTIONAL SIDE-BY-SIDE TWO SEATER

IMPROVED CHIEF 50 FOLLOWED IN 1939, WAS CLEANED UP VERSION OF THE PROTOTYPE MODEL 50 AND PRICED WELL BELOW THE AVERAGE LOW-PRICE CARS AVAILABLE TODAY.



The name Aeronca has been closely associated with personal plane design for nearly a quarter of a century and is derived from the corporate title of the firm—The Aeronautical Corporation of America. First Aeronca placed on the market was a high-wing single seater designed by Jean A. Roché, onetime top U. S. Army Air Corps aeronautical

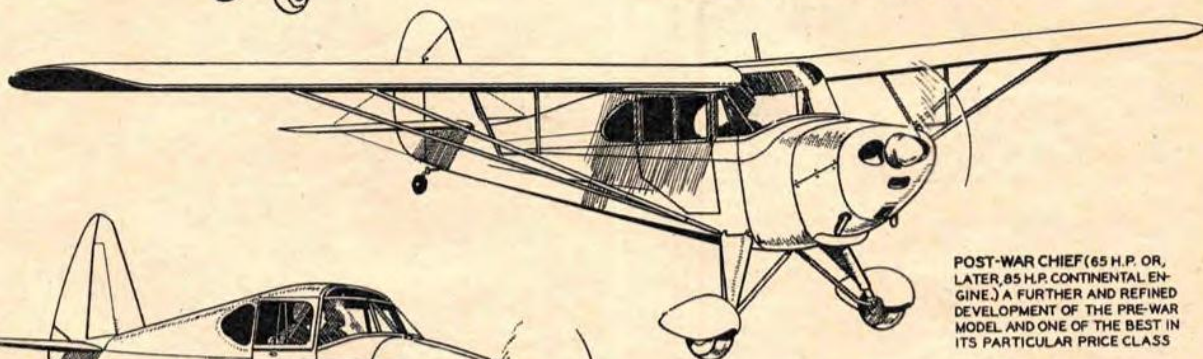
engineer and authority on aerodynamics. His Aeronca Model C-2 would today be considered an ultra-light lightplane, but had remarkable performance considering its low power.

The "C" series was dropped in 1936 and after a short venture into the low-wing field Aeronca came out with the famed "Chief" and "Tandem" models which with minor

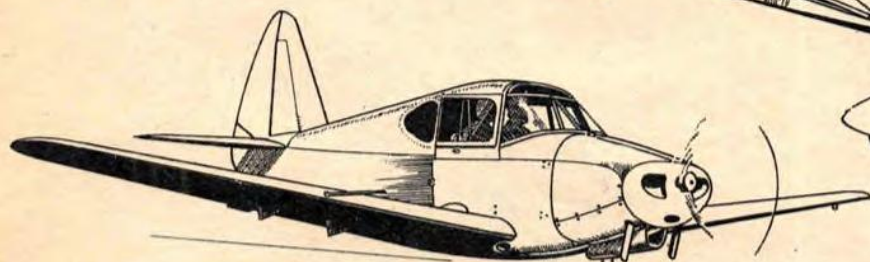




AERONCA CHUM (85 H.P. CONTINENTAL ENGINE) — FIRST ALL-METAL AERONCA PERSONAL PLANE. ITS SPINPROOF CHARACTERISTICS AND GENERAL RESEMBLANCE TO THE ERCOPE ARE EXPLAINED BY THE FACT THAT IT WAS MANUFACTURED UNDER LICENSE FROM ERCO—HOLDERS OF THE PATENTS INVOLVED



POST-WAR CHIEF (65 H.P. OR, LATER, 85 H.P. CONTINENTAL ENGINE.) A FURTHER AND REFINED DEVELOPMENT OF THE PRE-WAR MODEL AND ONE OF THE BEST IN ITS PARTICULAR PRICE CLASS



AERONCA ARROW THIS PLEASING CABIN MONOPLANE WAS A POST-WAR EXPERIMENTAL DESIGN AND MARKED THE RETURN OF THIS COMPANY TO THE LOW-WING FIELD



AERONCA CHAMPION (65 H.P. OR, LATER, 85 H.P. CONTINENTAL ENGINE) THIS POST-WAR TANDER TWO-SEAT TRAINER FOLLOWS THE FAMILIAR PATTERN OF PREVIOUS AERONCA TANDERS



AERONCA DEFENDER (A. A. F. DESIGNATION L-3J (65 H.P. CONTINENTAL ENG.) PRIVATE, COMMERCIAL & MILITARY TRAINER

DOUGLAS  
ROLFE



AERONCA L-3 (O-58B) (65 H.P. CONTINENTAL ENG.) MILITARY LIASON PLANE



NOORDUYN UC-64A (600 H.P. P. & W. ENGINE) 8-PASS./CARGO TRANSPORT

WORLD WAR MILITARY PLANES OF AERONCA DESIGN ARE SHOWN HERE TOGETHER WITH AN EXAMPLE OF ANOTHER MANUFACTURER'S DESIGN WHICH THEY WERE ABOUT TO PRODUCE WHEN THE ORDER, FOR SOME REASON OR OTHER, WAS CANCELLED

modifications are still decidedly popular U.S. lightplanes.

During World War II Aeronca made major contributions by supplying liaison planes and glider trainers of its own design. It also built planes to other manufacturers' designs—notably the Fairchild primary trainers. Like other manufacturers it entered the postwar period with several

ambitious designs to meet the expected and unfulfilled market for personal planes. Both the Aeronca designed low-wing cabin plane and the later type built under license from Erco (Weick) failed to achieve their purpose in a dwindling market, and the postwar model "Champion" remained the principal and more salable production model.



JUNE 1953 / 35 CENTS

# Air Trails



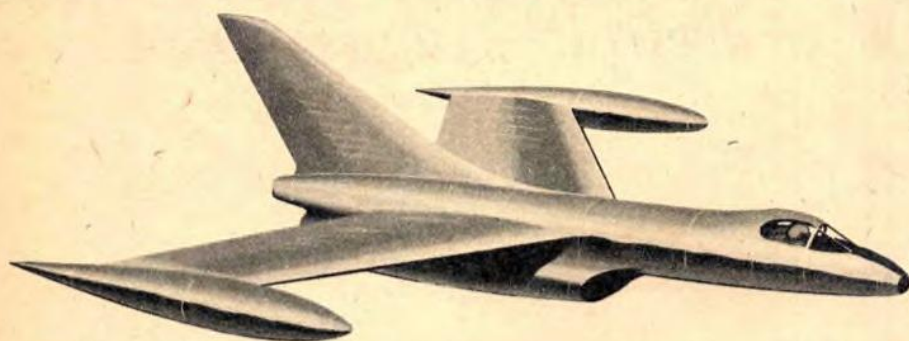
**BIG, NEW  
SECTION  
"RADIO  
CONTROL  
MODELS"**

**Air Progress: Supermarine Story  
Flying Wing • Beginners' Glider**

GAL SMITH

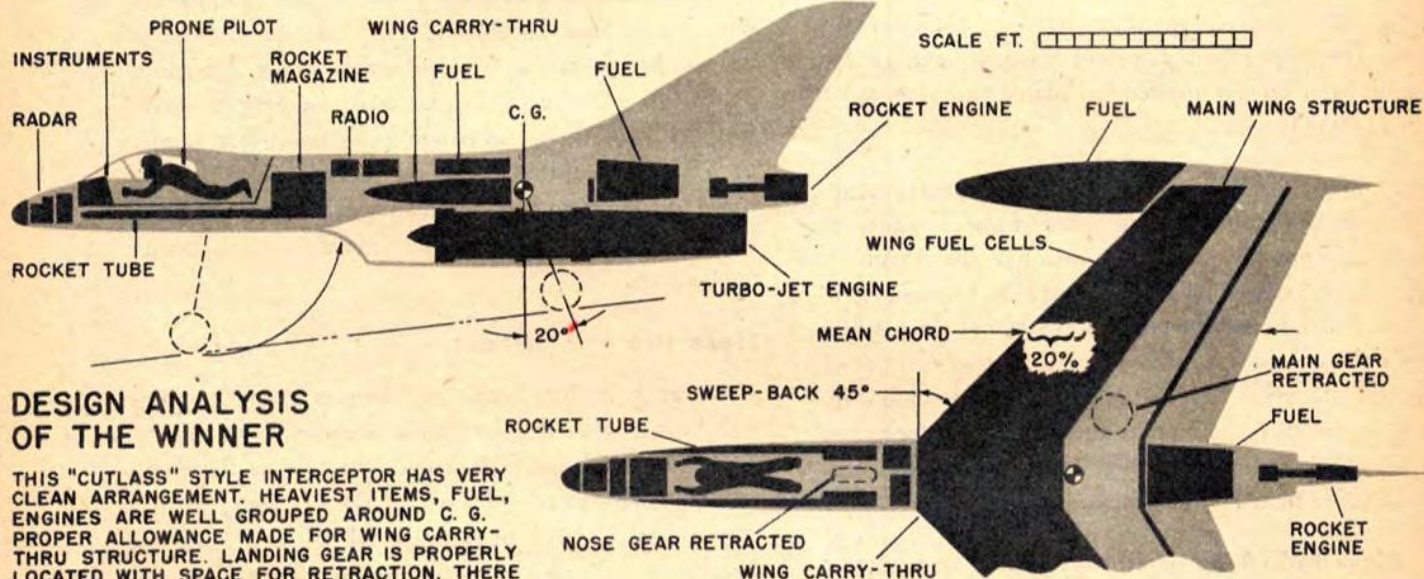


# AIRMEN OF VISION DESIGN COMPETITION



## 1<sup>ST</sup> Prize-Winning Design

All-weather interceptor, capable of supersonic speed, by Tim Vanecsek of Granger, Texas. Design has been broken down and analyzed by "AT" technical staff to indicate some of the basic requirements necessary to win. Plane carries twelve 2.75 in. rockets internally stowed. Pilot lies prone, which gives him a higher "G" tolerance when maneuvering at high speed. Two 10,000 lb. thrust jets and one rocket.

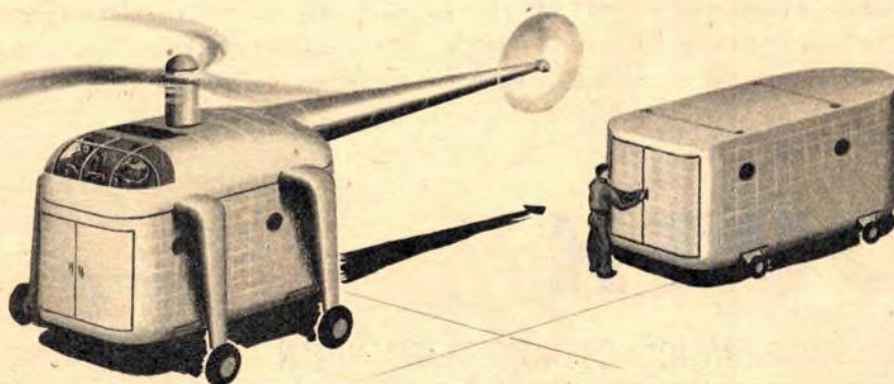


### DESIGN ANALYSIS OF THE WINNER

THIS "CUTLASS" STYLE INTERCEPTOR HAS VERY CLEAN ARRANGEMENT. HEAVIEST ITEMS, FUEL, ENGINES ARE WELL GROUPED AROUND C. G. PROPER ALLOWANCE MADE FOR WING CARRY-THRU STRUCTURE. LANDING GEAR IS PROPERLY LOCATED WITH SPACE FOR RETRACTION. THERE IS AMPLE SPACE FOR FUEL.

## 2<sup>ND</sup>

Cargo and passenger transport helicopter with detachable pod looks like lumber yard loader.

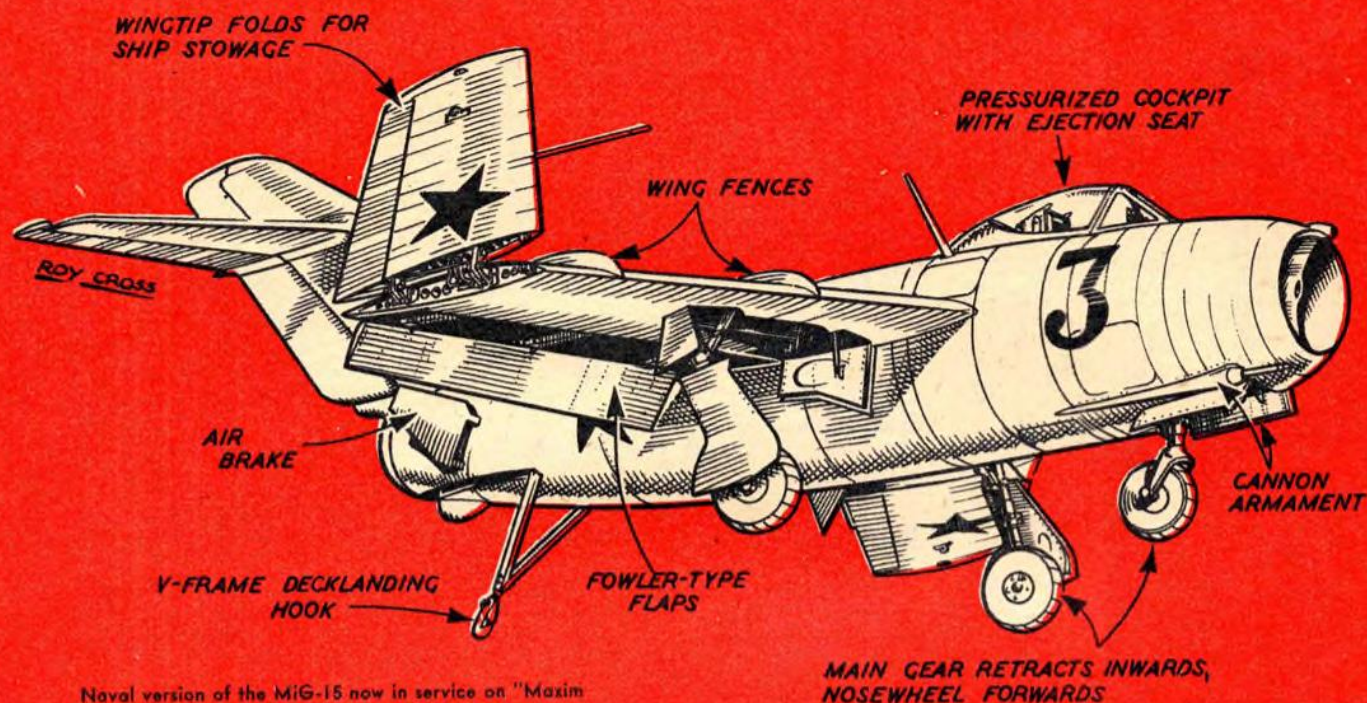


This interesting design was submitted by 15-year-old Allen Kuhn, student of Inglewood (Calif.) High School. The general idea is similar to the Hughes XH-17 load lifter. Detachable pod can carry eight passengers or 2285 lbs. of cargo. When the helicopter discharges its cargo at destination, another loaded pod can be attached to it and flown to another point. The 'copter is powered by a 600 hp engine, which seems a trifle low for this type of craft; should be at least 900 lbs.

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.





Naval version of the MiG-15 now in service on "Maxim Gorki" and other Soviet carriers. Reinforced fuselage.

# Red Russia's Remarkable Aircraft Industry

**But like a Capitalistic country, Soviet air industry battles production bottlenecks**

**By WILLIAM GREEN**

**Illustrated by ROY CROSS**

■ Russia now ranks among the first three great powers in airplane design. The USSR's rapid progress in combat airplane design since the war has frequently been attributed to her legacy of German research results and technicians, but although German influence is to be seen in the design of current Red warplanes, the fact that Russian research had advanced to a degree where the most advanced ideas of the German industry could be assimilated is the important point. The Soviet Union

possesses the largest and most comprehensive government-sponsored system of aviation research establishments in existence, and her postwar planes are by no means slavish copies of German wartime projects.

Early in 1947 the British government made a very serious mistake when it exported to the Soviet Union a quantity of Rolls-Royce Nene jet engines, the acquisition of which by the Russians directly resulted in the MiG-15's ability to mix it with the finest combat airplanes of the West.

It is instructive to note how the "pirating" of this engine design lifted the Soviet airplane industry over a very unpleasant period in which her own turbo-jets and those taken from German wartime designs were insufficiently developed to be considered as production engines.

The first Red version of the RD-45 delivered 5,000 lb. thrust and was directly comparable with the type of Nene supplied by Britain. Russian development resulted in an up-rated version giving 6,000 lb. thrust dry and 6,750 lb. with water injection. This engine is installed in recent production MiG-15 fighters.

That the Russians had succeeded in copying the Nene was a fact occasioning widespread concern in Western military aviation circles, but even more disconcerting was the knowledge that Russian metallurgists had succeeded in developing efficient nickel-chromium base alloys for high-temperature applications.

Paralleling development of the centrifugal RD-45 series of jet units, Soviet technicians have perfected a series of high-powered axial-flow engines based on German designs. The first, a straightforward development of the Jumo 004H, which went into production in 1947, developed 4,400 lb. thrust. Progressive development has brought it into the 6,000 lb. thrust category; it now powers the Ilyushin Il-28. More advanced axials based on the Jumo 012 and the BMW 018 deliver 9,000 lb. thrust and over 11,000 lb. with afterburning.

Airframe manufacturing standards in the Soviet Union are in no way inferior to those of the United



States. Although German influence can be seen in the basic configurations of current Soviet machines such as the MiG-15, La-17 and Il-28, their "obvious" layouts and conventional semi-monocoque stressed-skin structures are fully in keeping with Russian design mentality. *Cheap and easy production remains the policy.*

The equipment of modern Soviet combat aircraft is now appreciably more comprehensive than it was two or three years ago. Instrumentation is adequate and radio equipment is of very high quality, both in design and manufacture. Gunsight and A.I. radar, blind-landing aids and ejector seats have been adopted, and ordnance is of a high standard. The standard fighter weapons are currently the 37-mm N and the 23-mm NS cannon which are identical in general layout, mounting and ammunition feed. Open link ammunition is used, the links being stripped before the rounds enter the feedway of the gun. This type of ammunition was coming into use with the *Luftwaffe* during the war years. Air-to-air missiles have been developed and when carried by the MiG-15 they are housed in wing-mounted jettisonable containers.

Russia's European satellites are being bled to aid the build-up of Communist air strength. Czechoslovakia, Poland and East Germany are heavily committed to the manufacture of components, sub-assemblies, instruments and equipment for Russian plants, and the Czech aircraft industry is now producing complete MiG-15s.

Main plant in the Czech program is the former Aero factory at Vysocany which produces the fuselages. The former *Rudy Letov* and *Avia* plants at Letnany and Cakovice are manufacturing the wings and various components, while complete RD-45 turbo-jets are produced at the Walter plant at Jinonice. The final assembly and testing of the Czech-built MiG-15s are not undertaken in Czechoslovakia, some machines being assembled in East Germany, but the bulk being shipped to ex-Jap plants in Manchuria where they are assembled and test-flown. Although the first MiGs flying in Korea came from Russian plants in the Urals, all deliveries made during the past year have been from Czechoslovakia. Thus, the build-up of Sino-Communist and North Korean air strength does not tax Russian production.

World War II saw the transfer of the bulk of the Soviet airplane plants west of longitude 45 deg. E., to the Urals and Siberia. Although most of the evacuated plants have since been rebuilt and the Moscow and Leningrad areas are once again important centers of aircraft manufacture, the wartime move means that European Russia no longer has bulk of the industry.

There are today more than one hundred major production plants (airframes, engines, accessories and repairs) in the Soviet aircraft industry, some sixty-five per cent of these in western and eastern Siberia, the Urals, the Far North and the Far East. The limitations of the Russian surface transportation system have necessitated the forming of these areas into self-contained production complexes. These separate industries will permit Russia to fight a two- or three-front war, but the economic disadvantages are obvious.

Light metal production remains the biggest obstacle in the path of airplane production expansion. At least five large aluminum plants have been built since the war, but in 1948 production of raw aluminum was only some 165,000 tons as compared with some 990,000 tons in the U.S.A. during that same year. Recent discoveries of large bauxite deposits will not materially affect Soviet aluminum production for years, owing to shortages of electric power, water and transport.

In a short war, production potential is much less

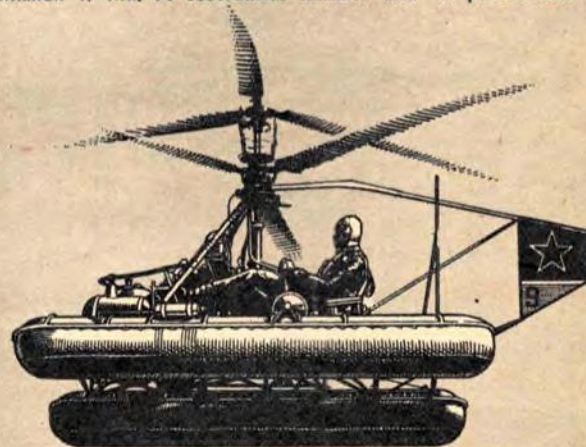
important than initial stocks. The Russian airplane industry is troubled by serious shortages of raw materials, shortages which cannot be completely overcome for many years and which indicate that, from the standpoint of production potential and the ability to wage sustained air war, *everything but force is on our side.*



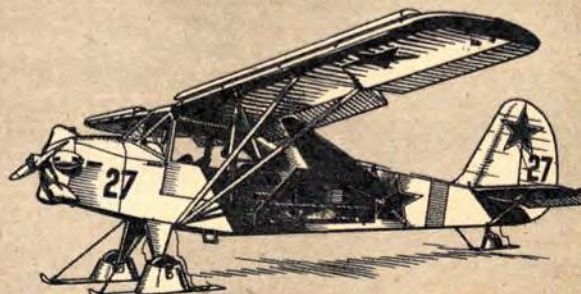
Yak-16, originally designed as feeder transport, used by Red AF as radio/navigation trainer. Transparent plastic nose.



Standard Soviet Army four-place helicopter designed by Mikhail I. Mil. A substantial number now in production.



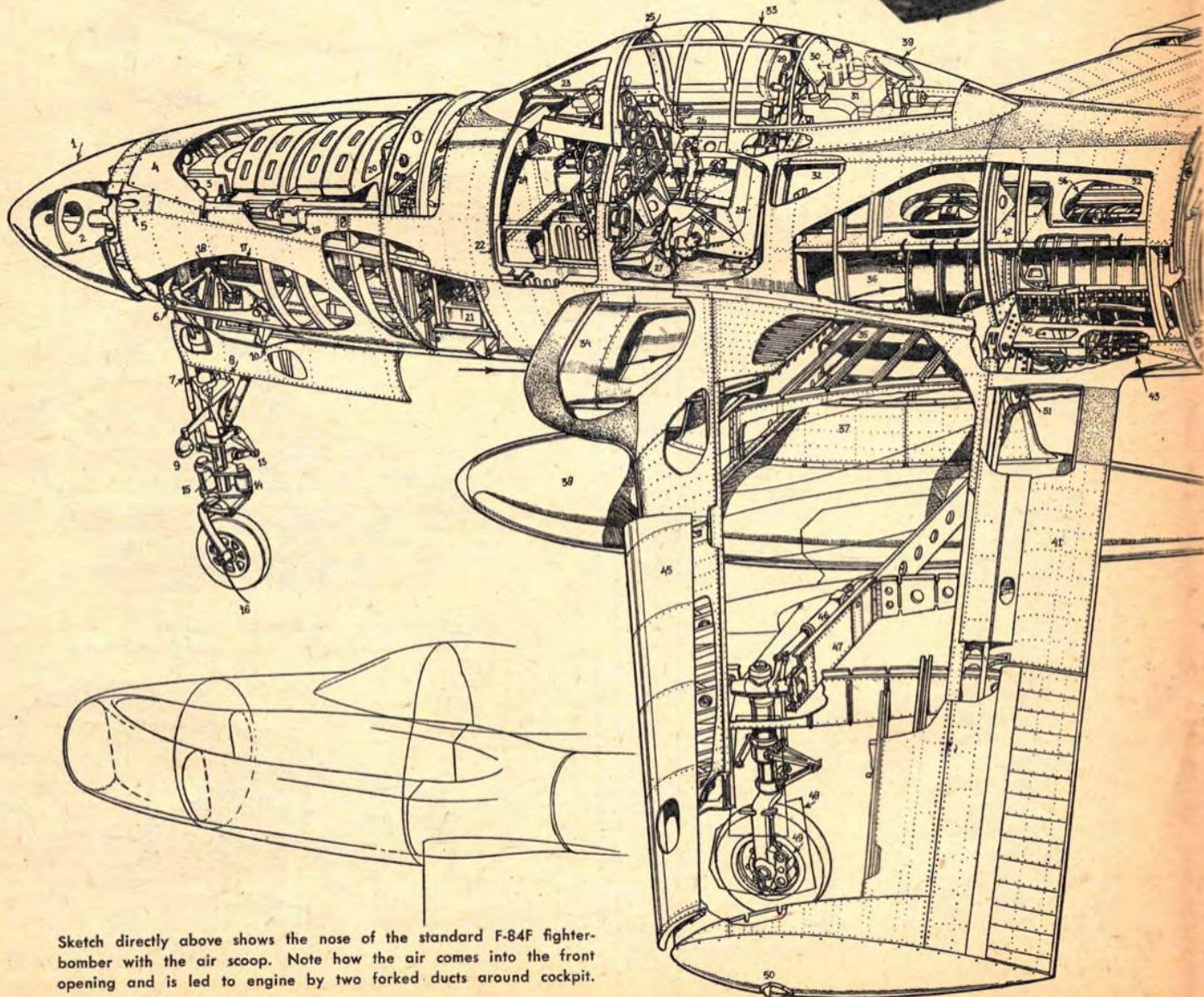
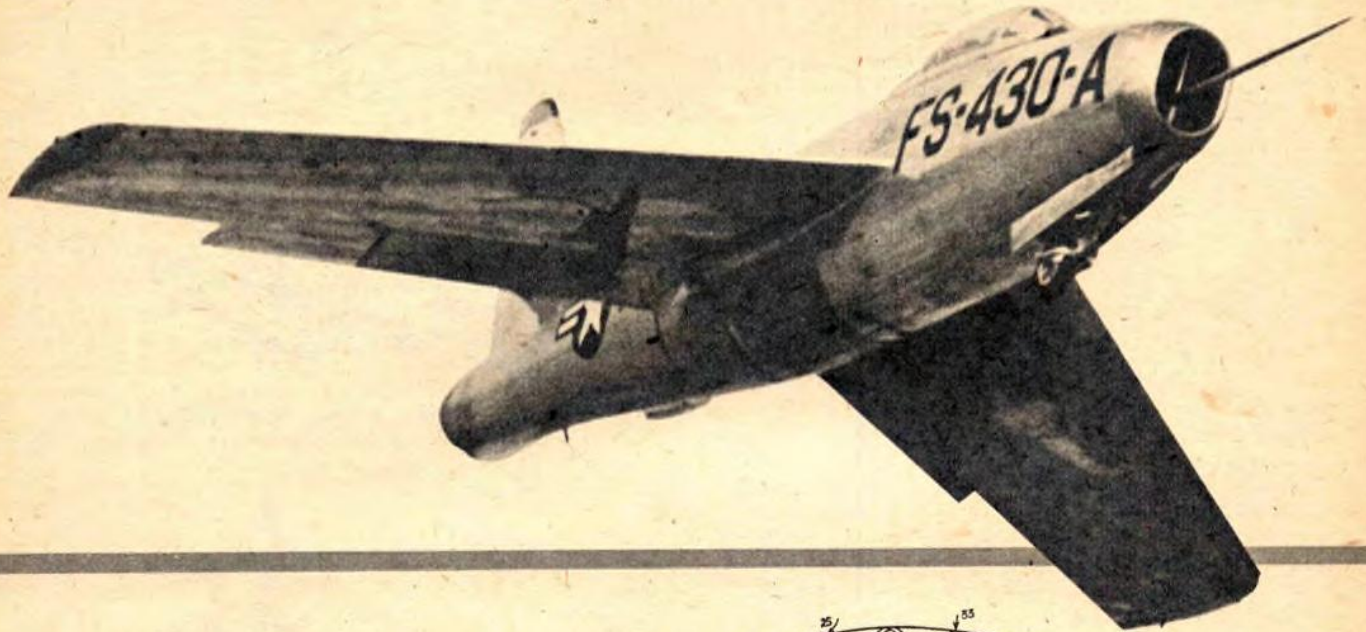
Kamov light helicopter, flown by Soviet Navy for observation, is carried aboard large submarines. Contrarotation rotors.



Improved version of Yak-14 liaison lightplane, widely used by Soviet AF. Has casualty entry hatch in aft section of fuselage.



# Grandson of the Thunderbolt



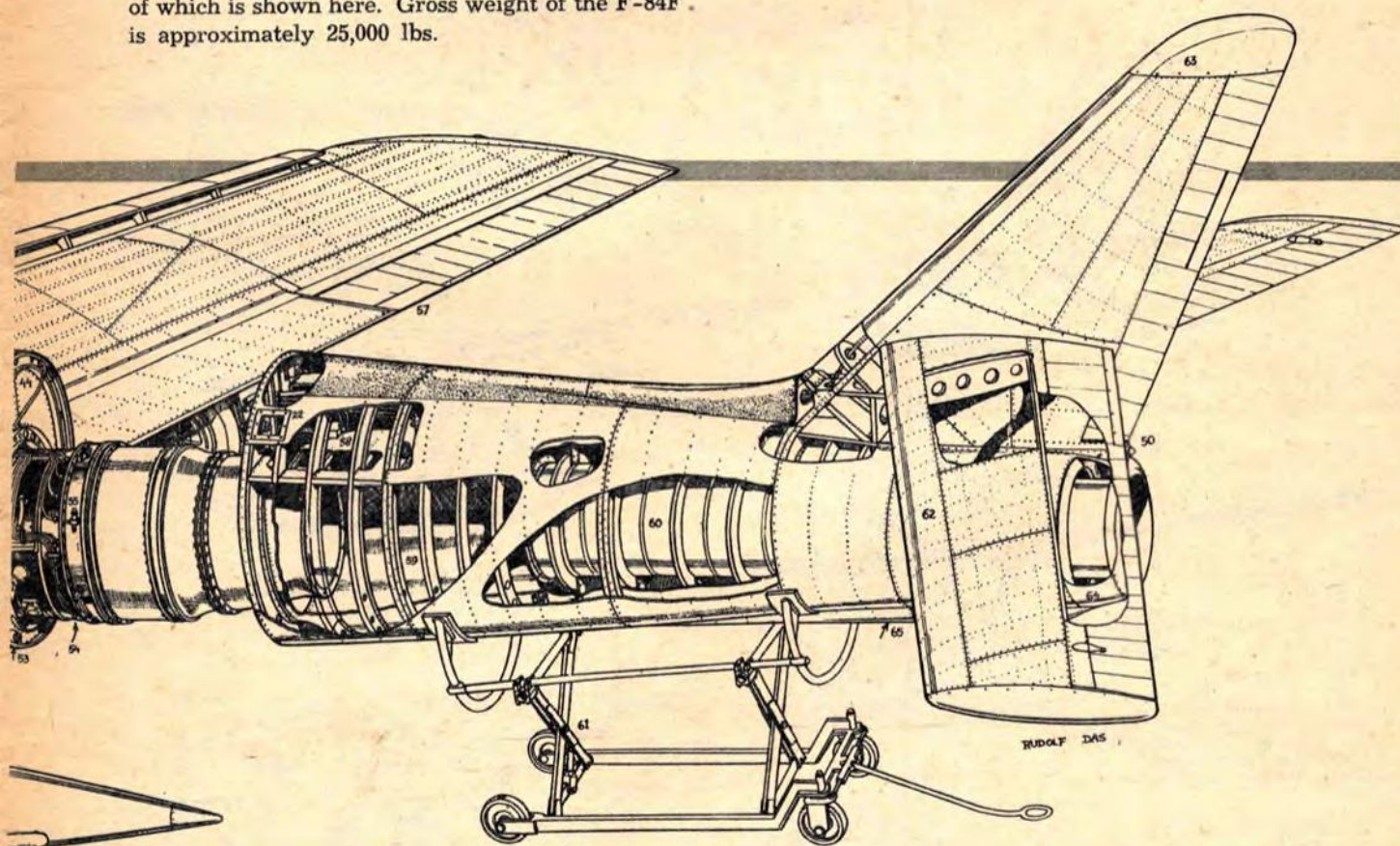
Sketch directly above shows the nose of the standard F-84F fighter-bomber with the air scoop. Note how the air comes into the front opening and is led to engine by two forked ducts around cockpit.



■ Another star on the horizon of a long line of famous aircraft, the F-84F Thunderstreak is a faster, harder-hitting sister of the Thunderjet, close-support fighter-bomber which so valiantly acquitted itself in Korea. Although basically same as the straight-wing F-84E Thunderjet, the Thunderstreak has undergone many changes in order to give it added speed and huskiness required to take the 7,200-lb. push of the powerful Wright J-65 Sapphire engine. It exists in two different models, one with the conventional nose air intake and the other mounting air intakes in extended wing root ducts, which permits the installation of camera equipment in the nose for photo reconnaissance work. This model is designated as RF-84F. There is also a version of the solid-nose Thunderstreak mounting machine guns in the nose, the cutaway of which is shown here. Gross weight of the F-84F is approximately 25,000 lbs.



Thunderstreak and its war load. As bomber the plane can carry 24 5-inch HVAR rockets or four 1000 lb. bombs, or a mixture of fuel and armament such as two 1000 lb. bombs and two 230 gallon tanks.



1. Plastic antenna housing. 2. Radar antenna. 3. Radar voltage regulators and other electronics. 4. Hinged nose panel. 5. Gun-blast protection panel. 6. Nosewheel mounting. 7. Leg shortening strut. 8. Up-lock. 9. Landing light. 10. Nose gear retracting mechanism. 11. Forward fuselage fuel tank. 12. Retracting mechanism mounting. 13. Torsion scissor. 14. Shimmy neutralizer. 15. Shock-absorbing strut. 16. Static discharge. 17. Nosewheel operating jack. 18. Wheel doors and landing gear inter-connection. 19. Browning .50 cal. machine gun. 20. Ammunition boxes. 21. Battery. 22. Inspection panel. 23. Radar gunsight and gun camera's. 24. Radio, radar computers and

automatic pilot. 25. Armored windshield. 26. Pilot's control stick. 27. Ejection-seat foot rest. 28. Pilot's ejection-seat. 29. Head rest. 30. Armor plate. 31. Radio-compass loop. 32. Main fuel tank. 33. Electrically operated sliding canopy (on prototype only, production machines with hinged hood.) 34. Wing-root air intakes. 35. Wing fuel tank. 36. Wright J-65 engine (license of British-built A. S. Sapphire). 37. External wing-tank strut. 38. 450 gal. under-wing tank. 39. Inspection panel in Plexiglas hood. 40. Oil tank. 41. Hydraulically operated flap. 42. Firewall. 43. Fuel filter and flow regulator. 44. Main fuselage bulkhead. 45. Automatic slot. 46. Main landing gear op-

erating jack. 47. Auxiliary wing spar. 48. Wheel door fixed to oleo-strut. 49. Hydraulic brakes. 50. Navigation lights. 51. Aft wing-fuselage attachment. 52. Engine mount. 53. Fuselage joint. 54. Fuel lines. 55. Engine burners. 56. Rail for engine removal. 57. Trim tab. 58. Radio. 59. Rear fuselage (internally insulated for jet pipe cooling). 60. Jet pipe. 61. Rear fuselage transport dolly. 62. "Flying tail." 63. Plastic part of fin with flush V.H.F. antenna. 64. Removable tail-cone. 65. Tail bumper.

Detail drawing shows form of air inlet ducts in first production machines with nose intakes.



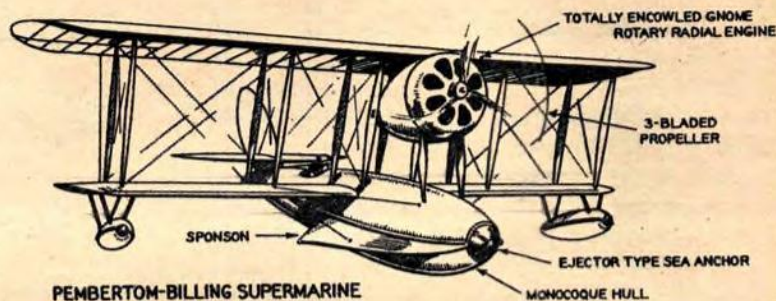
# AIR PROGRESS

## THE SUPERMARINE STORY

By DOUGLAS ROLFE



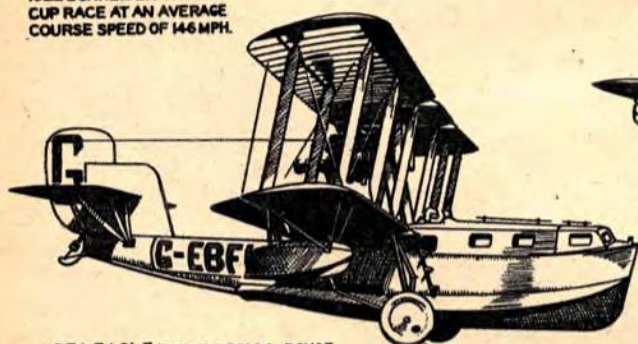
SEA LION MK. II (450 H.P. NAPIER LION) WINNER OF 1922 SCHNEIDER TROPHY CUP RACE AT AN AVERAGE COURSE SPEED OF 146 M.P.H.



PEMBERTON-BILLING SUPERMARINE  
STREAMLINE CONCEPTION 40 YEARS AGO.



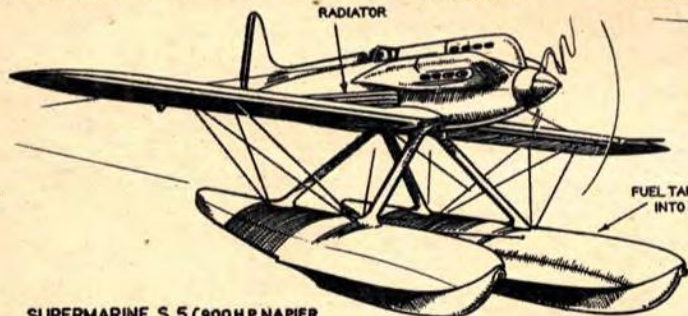
SEAL MK. II (450 H.P. NAPIER LION)  
A 1922 DECK LANDING AMPHIBIAN  
WHICH WAS USED BY MANY NAVIES  
OF THE WORLD DURING THIS ERA.



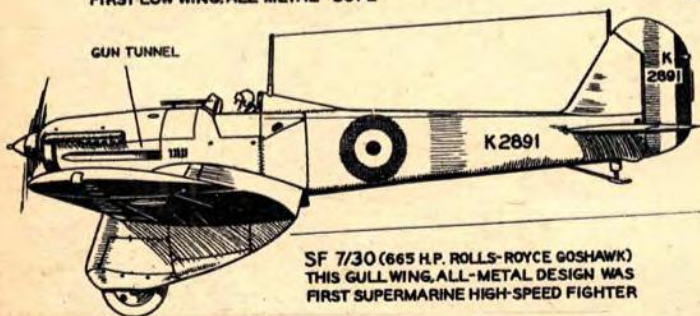
SEA EAGLE (360 H.P. ROLLS-ROYCE  
EAGLE), A COMMERCIAL AMPHIBIAN  
PRODUCED IN 1922. 6-8 PASSENGERS



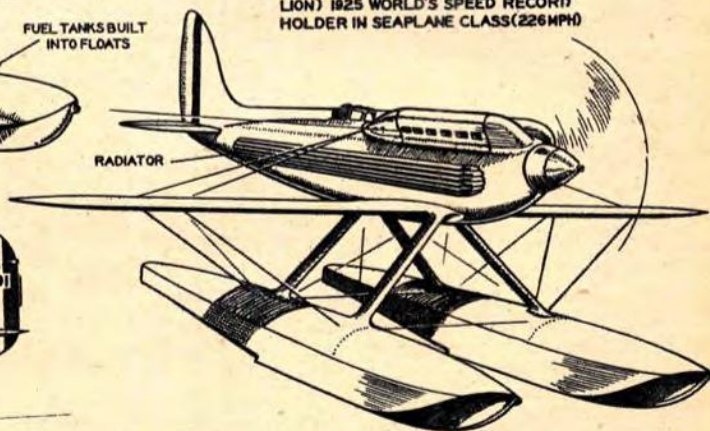
SUPERMARINE S.4 (630 H.P. NAPIER  
LION) 1925 WORLD'S SPEED RECORD  
HOLDER IN SEAPLANE CLASS (226 M.P.H.)



SUPERMARINE S.5 (900 H.P. NAPIER  
LION) 1927 SCHNEIDER CUP WINNER  
AT AVERAGE SPEED OF 281 M.P.H. AND  
FIRST LOW WING, ALL-METAL "SUPE"



SF 7/30 (665 H.P. ROLLS-ROYCE GOSHAWK)  
THIS GULL WING, ALL-METAL DESIGN WAS  
FIRST SUPERMARINE HIGH-SPEED FIGHTER



SUPERMARINE S.6 (1,800 H.P. ROLLS-ROYCE)  
1929 SCHNEIDER CUP  
WINNER AT 328 M.P.H. - S.6B SET 407 M.P.H. SPEED RECORD IN 1931

The Supermarine company was established in 1912 and although today its name is immediately associated with high-speed military aircraft, it engaged at first in the production of flying boats and amphibians. The first model illustrated here was designed by Capt. Noel Pemberton-Billing in 1914, and looking at this 39-year-old boat it seems incredible that anything so advanced could have been conceived and built so long ago.

Further examples of early Supermarine boats are shown, but none

is quite so boldly imaginative as the first Pemberton-Billing design. Despite this, in 1922 a Supermarine boat proved good enough to win the coveted Jacques Schneider Trophy races—the classic speed event of the period.

In 1928 the company was absorbed by the great engineering and armament firm of Vickers and today forms part of the Aviation Division of Vickers-Armstrong Ltd. Even before the merger Supermarine had started developing high-speed aircraft. Their brilliant

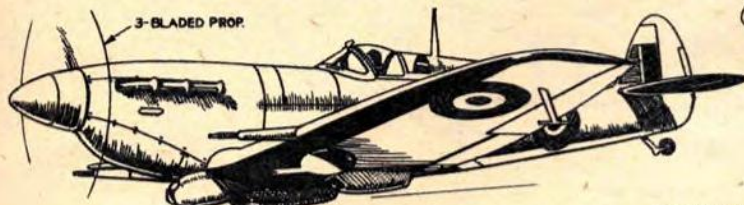




2-BLADED WOODEN PROP.

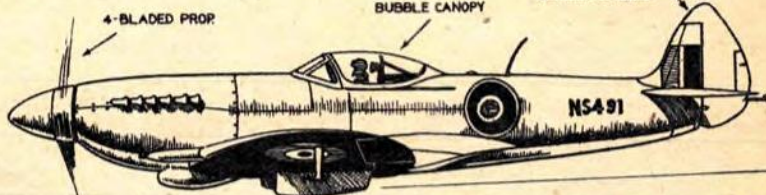
PROTOTYPE SPITFIRE. CULMINATION OF R.J. MITCHELL'S RACING DESIGN EXPERIENCE, THE ELLIPTICAL WINGS SACRIFICED SPEEDY PRODUCTION FOR EXCEPTIONAL MANEUVERABILITY. IT WAS FIRST FLIGHT TESTED IN EARLY 1936.

NOTE: DEVELOPMENT OF THE SPITFIRE FROM PROTOTYPE MODEL TO PRESENT AND DOUBTLESS FINAL FORM COVERS A PERIOD OF MORE THAN 17 YEARS. A FEW OF THE MORE IMPORTANT DEVELOPMENTS OF THE ORIGINAL DESIGN ARE SHOWN ON THIS PAGE. THE SEAFIRE IS SIMPLY THE NAVAL VERSION OF THE SPITFIRE



L.F. MK. 5b SPITFIRE (1,585 H.P. ROLLS-ROYCE MERLIN. CLIPPED WING, CANNON-ARMED "SPIT" DATES FROM ABOUT 1941.

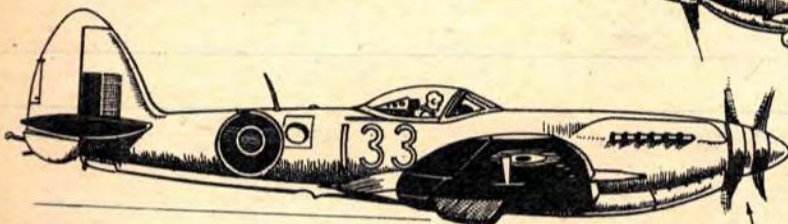
MK. I SPITFIRE (1,030 H.P. ROLLS-ROYCE MERLIN) THE FAMED 8-GUN BATTLE OF BRITAIN "SPIT"



4-BLADED PROP.

BUBBLE CANOPY

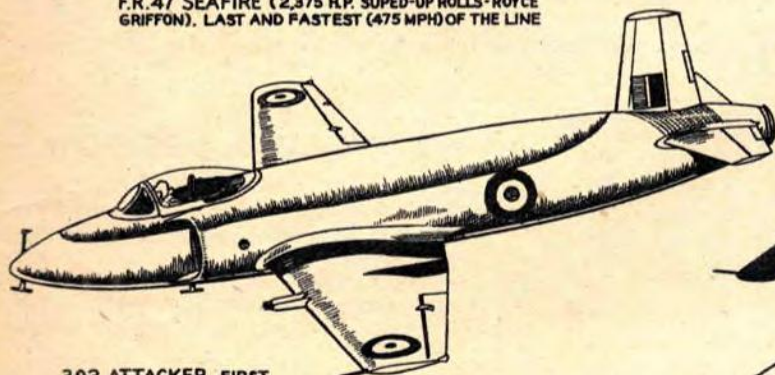
NOTE MODIFIED RUDDER OUTLINE



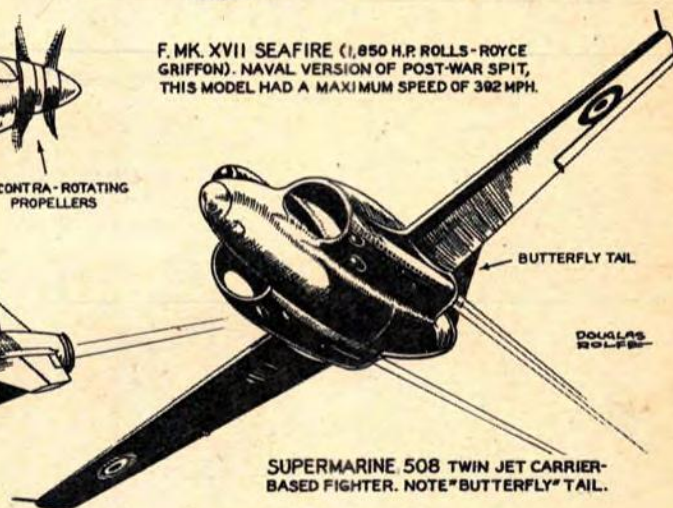
F.R. 47 SEAFIRE (2,375 H.P. SUPED-UP ROLLS-ROYCE GRIFFON). LAST AND FASTEST (475 MPH) OF THE LINE

F. MK. XVII SEAFIRE (1,850 H.P. ROLLS-ROYCE GRIFFON). NAVAL VERSION OF POST-WAR SPIT, THIS MODEL HAD A MAXIMUM SPEED OF 392 MPH.

CONTRA-ROTATING PROPELLERS



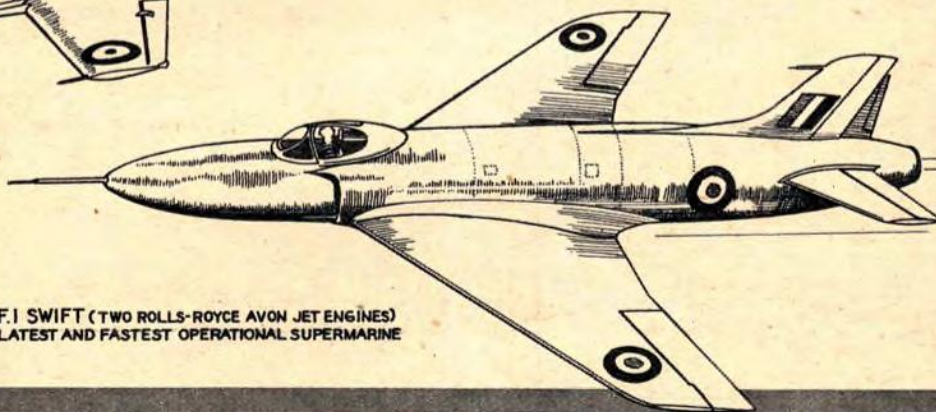
392 ATTACKER FIRST OPERATIONAL CARRIER-BASED JET FIGHTER PRODUCED BY SUPERMARINE.



BUTTERFLY TAIL

DOUGLAS ROLES

SUPERMARINE 508 TWIN JET CARRIER-BASED FIGHTER. NOTE "BUTTERFLY" TAIL.



F.1 SWIFT (TWO ROLLS-ROYCE AVON JET ENGINES) LATEST AND FASTEST OPERATIONAL SUPERMARINE

designer, R. J. Mitchell, produced the famed "S" model racing planes which won the Schneider Cup races three times in succession (1927, 1929 and 1931), boosted airspeed beyond the 400-mile mark and paved the way for the great Spitfire fighters which only recently have reached the obsolescent stage.

Development of the Spitfire itself is covered in some detail on these pages. The prototype model appeared in 1935 or thereabouts, and the production model, the Mark I Spitfire, was put into service

just in time to enable it to take a decisive part in the Battle of Britain. Since then there have been many modifications of this airplane and the current models (still in service though obsolescent) are considerably more powerful, faster and more heavily armed than the historic Mark I which they still closely resemble outwardly.

Latest Supermarine production models, notably the Attacker and the Swift, stand up with the world's best jet fighters and uphold the Supermarine reputation for fast, first-class military aircraft.



# Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

JULY 1953 / 35 CENTS



**BIG PLANES  
MODEL  
PLANES  
RADIO  
CONTROL**

**The Brave Baroness—First Licensed Lady Bird**  
***Air Progress: Goodyear-Continental Race Roundup***  
**La Sorra Wakefield Model • Swan Song Flying Boat**



# 1<sup>ST</sup> AWARD

## Submarine-Carrying Jet Flying Boat



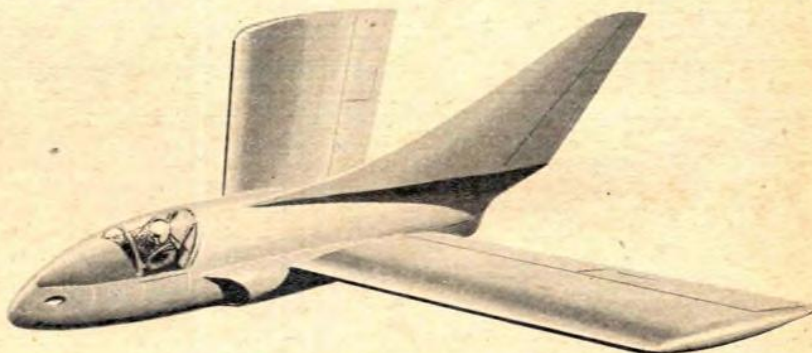
Woodrow W. Block of Hammond, Ind., came up with the most original design this month, a submarine-carrying jet flying boat. The submarine is a one-man job, carried in a special compartment of the flying boat's hull which is sealed off by watertight bulkheads. Inclined rails slide it off backwards into water through special doors in bottom of hull. Jet bomber then flies on.

# 2<sup>ND</sup> AWARD

## High Altitude Ramjet Seaplane Fighter

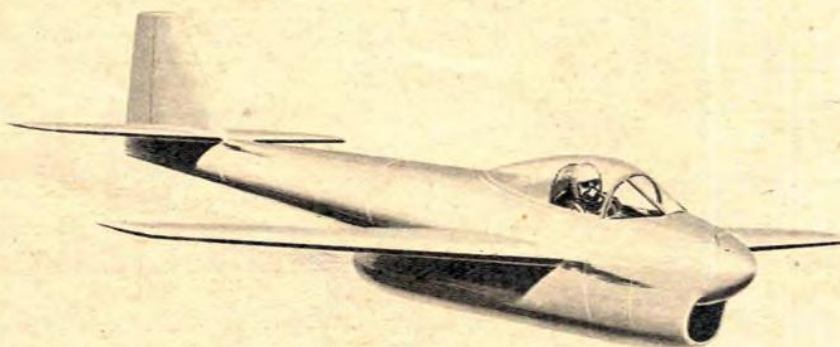


The Sea Demon, an inverse taper wing seaplane jet fighter by James Krasinski of Chicago, Ill. Power is supplied by two ramjet engines, with two auxiliary rockets for take-off to bring plane up to speed where the ramjets are effective. Air intakes close on landing to prevent water getting into ramjets. Retractable hydro-skis are used for take-off and landing. Sharp sweep-back of the wing makes use of horizontal tail unnecessary, the elevators being located in trailing edge of wing. Armament consists of six cannon in underside of the nose and two forward firing rockets. Top speed is 1,500 mph. Span 28 ft.



# 3<sup>RD</sup> AWARD

## Light Carrier-Borne Jet Attack Plane



Lightweight single-place attack plane by Robert D. Abernathy of Sayville, N. Y. Primary duty is to support landing operations of ground troops from aircraft carrier. Construction simple, to provide easy maintenance and maximum availability. Elevator and rudder control are by cable, aileron by pushrod. All tabs, cockpit canopy and arrestor hook are manually operated; flaps operate electrically. Plane is powered by a 1000-lb.-thrust turbojet, giving it a maximum 400-knot speed. Span 36 ft., lgth. 22 ft. 6 in.

## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

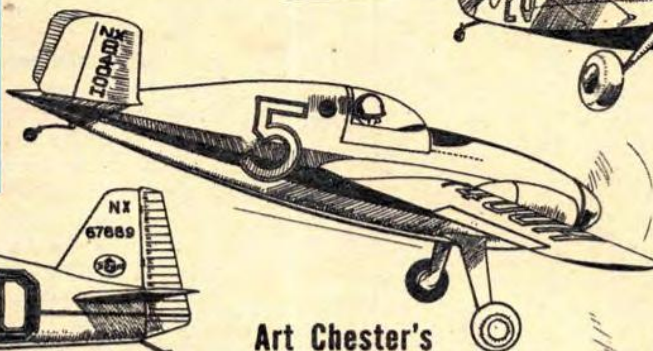
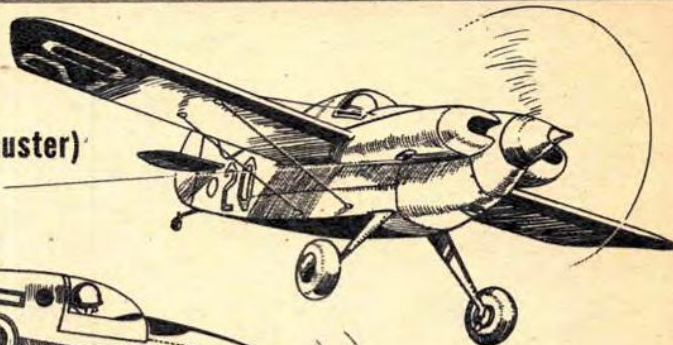
commercial aircraft, military planes (fighters, bombers, troop transports), planes of the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



# AIR PROGRESS

By DOUGLAS ROLFE

Wittman Special (Buster)



Art Chester's  
"Swee' Pea"

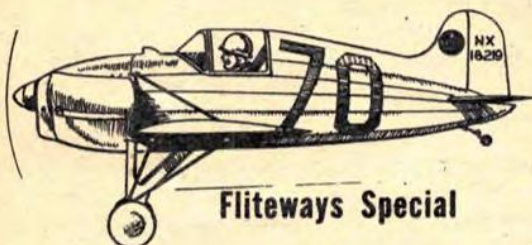


Levier "Cosmic Wind"

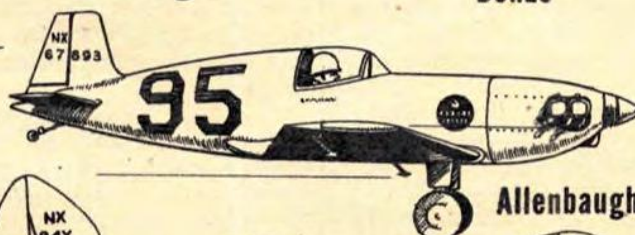


Wittman Special  
"Bonzo"

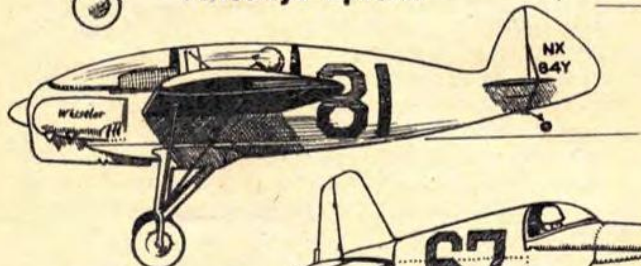
"Li'L Rebel"



Fliteways Special



Allenbaugh Special



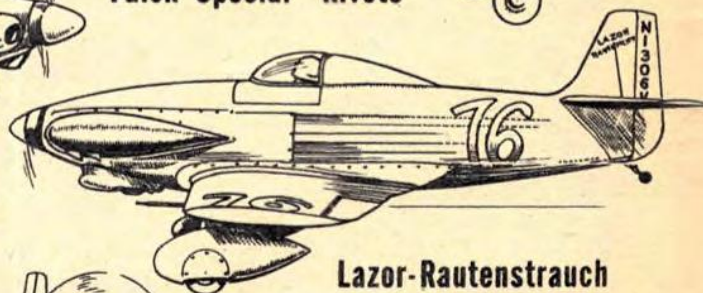
Francis-Angell  
Special



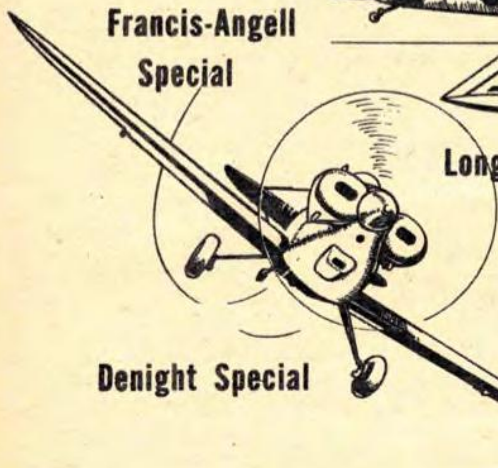
Falck Special "Rivets"



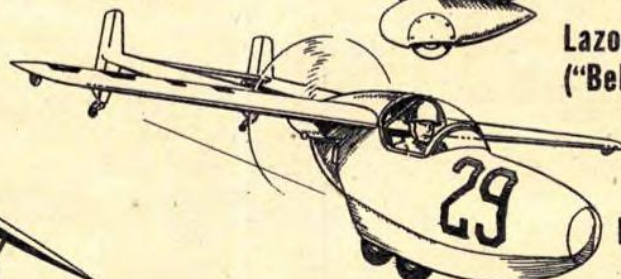
Long Special "Midget"



Lazor-Rautenstrauch  
("Belle of Bethany")



Denight Special



L. I. T. Special

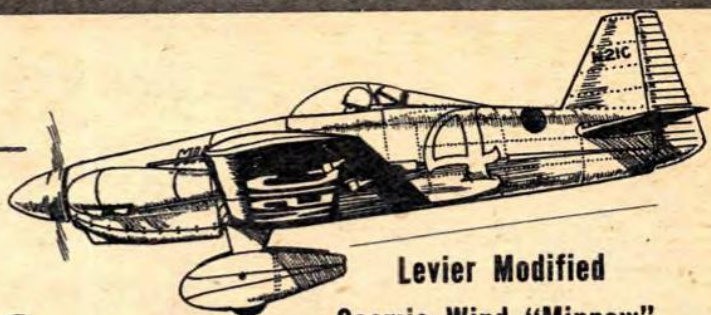
**GOODYEAR AND CONTINENTAL RACERS.** The second postwar National Air Races in Cleveland saw an entirely new class of racing planes take the place of the former Greve Trophy formula. Unlike the 500 cu. in. Greve racers, the tiny speedsters were powered by a 190 cu. in. displacement Continental flat four engine of 85 hp. Built to rigid specifications, they were safer than the small prewar racing planes.

The sponsor of the race at Cleveland was the Goodyear Tire and Rubber Co., which agreed to underwrite the event for three years, beginning with 1947, and awarding each year a sum of \$25,000 in addition to a handsome trophy. Continental Motor Corp. had a similar arrangement with the Miami Air Maneuvers, taking over from Goodyear after 1949. In addition, a number of smaller events were also held all over the country under varied sponsorships.

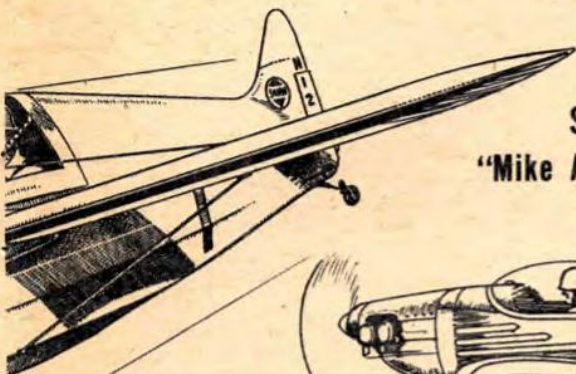




**"Shoestring"**



**Levier Modified  
Cosmic Wind "Minnow"**



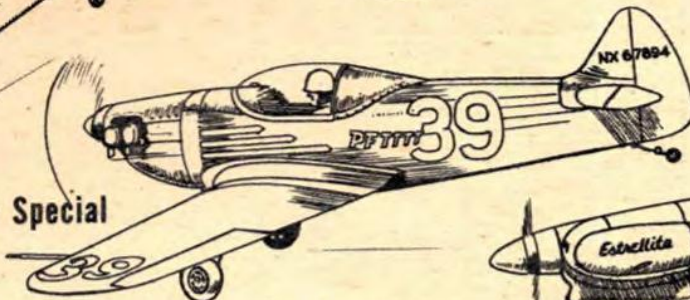
**Sorensen  
"Mike Argander"**



**Nimmo Special**



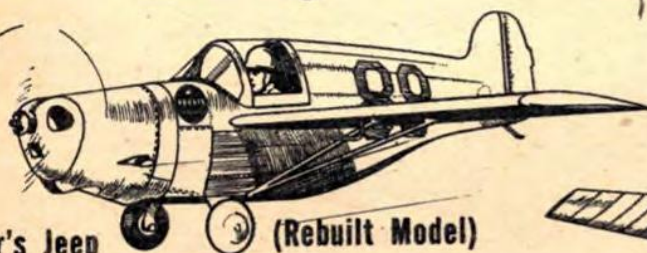
**Chester's Jeep**



**"Estrellita"**



**Reaver Special**



**Anderson Special**



**Pitts Special  
"Li'L Monster"**



**PAR Special**



**Foss Special "Ginney"  
(Later "Little Mike")**

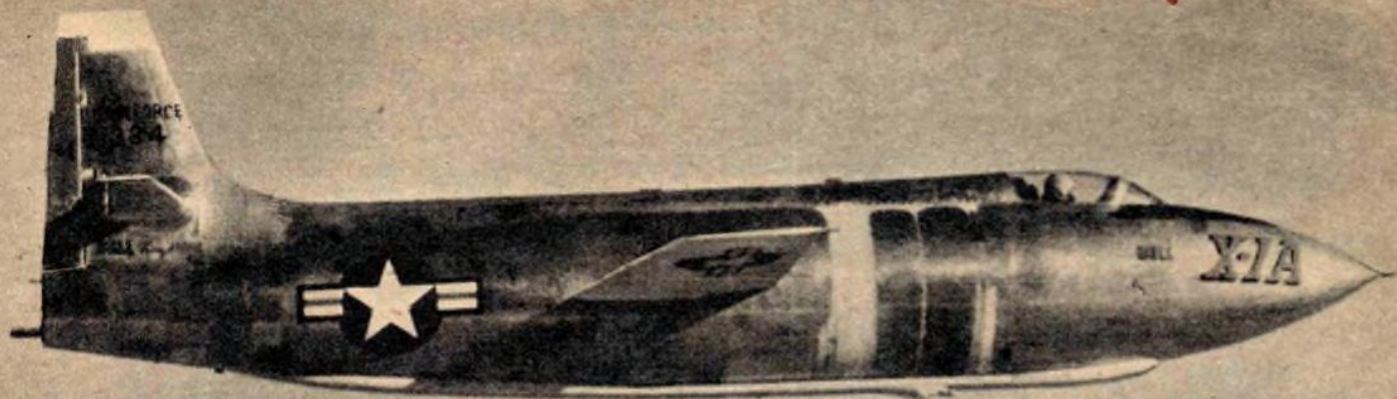


On these pages are presented some of the most notable midget racers, many of which have undergone considerable modification since the debut of pint-size competition. The earlier planes were built and flown by such old-timers as Wittman, Tony LeVier, Art Chester, and the newcomers did not have much chance. But the newcomers learned. A good example is Bill Falck, who in 1952 took second place in Detroit with his Rivets; and John Paul Jones, a

two-time winner of the Continental Trophy Race with his Shoestring.

However, in the long run it was the old maestro Steve Wittman and his Bonzo who came out on top after winning the last Continental Trophy race at Detroit, then retiring from aerial racing 23 for good. The fate of midget racing is uncertain since Continental has dropped its sponsorship, but it is hoped that another sponsor will appear to keep this interesting breed of racing planes alive.





## The World A-Wing

Bell X-1A, larger sister of supersonic X-1, now undergoing flight tests at Muroc. Powered by an improved Reaction Motors rocket.

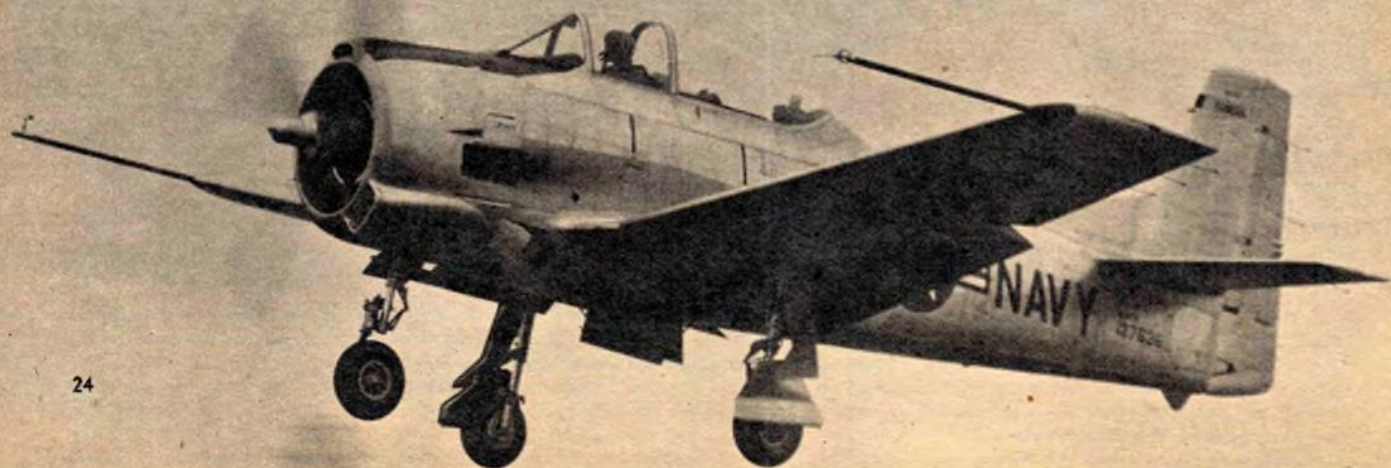


Lockheed F-94C Starfire at moment of landing. Top picture shows pilot chute about to pull out main chute. In bottom photo 16 ft. diameter main chute pops open and slows up fast-landing plane.



Sharp edge of the Sabre: rocket launcher on North American F-86D all-weather interceptor. Contains 24 "Mighty Mouse" 2.75" rockets. When not in use the launcher retracts inside fuselage.

North American T-28B, USAF trainer. More powerful version of earlier model. 1425 hp Wright. Rate of climb 3859 ft. per minute.





# Air FORECAST and REVIEW

**What Are Missiles?** They're suicidal freight-carriers. They have a warhead—an A-bomb or five lbs. of explosive—to carry to the enemy and blow up in his face. To be directed, missiles need guidance; you build in a brain, maybe help 'em part way with extra brains on the ground or in the air nearby. To push them along requires an engine—a rocket, ramjet or turbojet. To wrap this up, they need airframes, with wings or shaped body for lift, fins or control surfaces for stability and steering. They'll do things a plane can't do, take loads a pilot could never stand. They don't have to come back.

**How Is a Missile Different from Drones?** With a drone, you tell it where to go and how to get there. With a missile, you tell it when to go. It figures out where and how.

**What Are We Building?** In the U.S., we're concentrating on three types:

**Surface-to-surface (SSM).** These will be the mainstay of future bomber offensives, replace heavy artillery and ground-support aircraft. Big—fighter-plane size—and long-ranging (200 to 5,000 mi.), these will carry A-bombs, seek out enemy cities and troop concentrations, blast them. Speeds will be transonic to high supersonic; engines will be turbojets, ramjets, rockets or combinations of these. Guidance: precise autopilots monitored by star-tracking telescopes, radar mapping, earth's magnetic field. Examples: Martin Matador (AF), Chance Vought Regulus (Navy), Northrop Snark (AF), General Electric Hermes (Army).

**Surface-to-air (SAM).** These are anti-aircraft missiles, will bolster interceptors and flak in the job of area defense. Slim, pencil-shaped, and rocket-powered, these may be 15 or 25 ft. tall, completely portable, fired from anywhere. Speeds will be supersonic; missile will turn on a dime, chase its target and blast it—if the guidance works. Guidance: beam rider first, where missile rides the center of a projected radar beam like a twig in a brook; move the beam, the missile follows. Later types will have active homing, already proved in Fairchild's elderly Lark. With a homer, missile does its own tracking, finds target and hangs on, regardless of evasive action. Examples: Western Electric Nike (Army), John Hopkins Terrier (Navy), Boeing Bomarc (AF).

**Air-to-air (AAM).** These are for fighter armament, may replace the machine guns and cannon now used. Tiny (6 to 10 ft. long, 6 in. diameter), sleek and rocket-powered, they will be carried on a fighter's wings (they're too big now to house inside) and fired against big targets. Initially aimed by airplane direction, a homer system can take over and deliver missile to target. Examples: Sperry Sparrow (Navy), Hughes Falcon (AF).

**Who's Building Missiles?** Everybody. Look at the examples listed. Universities, laboratories, aircraft and engine manufacturers all get into the act.

**What's It Costing? Are Missiles Cheap?** We've spent about four billion since the end of WW II. Lots of that went for elaborate and necessary test stations and ranges; lots more for engineering talent; still more for electronics. And missiles aren't cheap and aren't likely to be. Right now, they compare in cost to standard fighter planes.

**Do We Have Any Missiles Ready Now?** No, we don't. Recent publicity was aimed at influencing Congress at budget justification hearings. No missiles defend our cities, arm our fighters, replace our artillery.

**Why No Missiles Now?** Well, missiles are a huge development program. To pile missiles on top of advanced manned aircraft in an industry plagued with an engineering shortage is asking for delays. Missiles require more knowledge of different sciences on a larger scale than even the A-bomb. Proof: Time and money spent on missiles and A-bomb development is about the same; A-bomb program has produced many more results.

We've lacked organization at the top until recently. Chrysler president K. T. Keller was appointed czar of the missile mess three years ago, spent the first year or so learning the ropes. His office still lacks power to ax or strengthen.

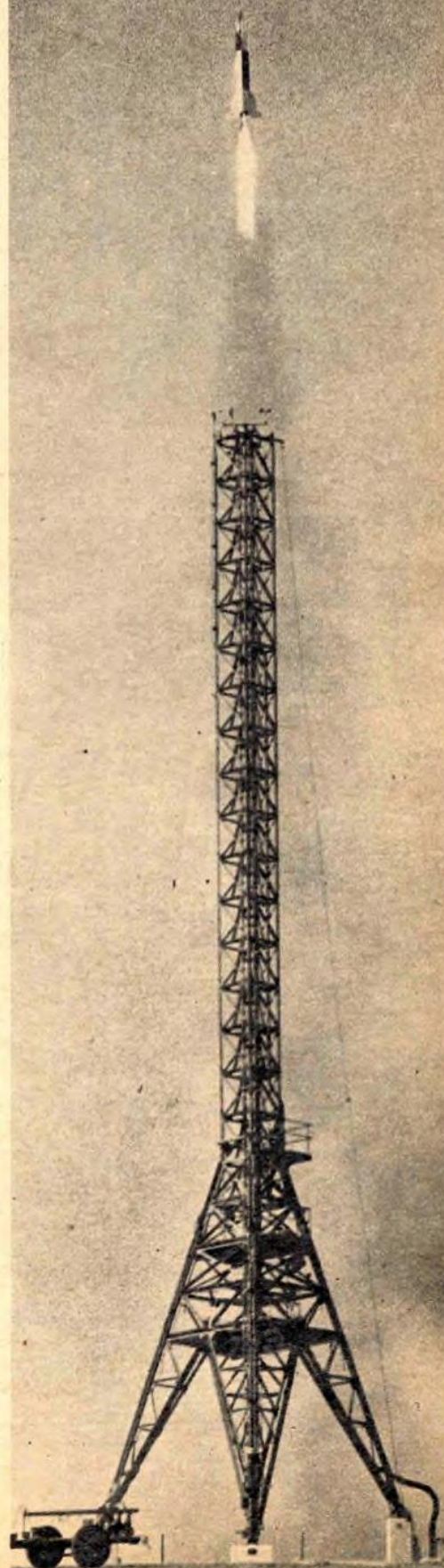
Inter-service squabbles delay action. Example: Is anti-aircraft air defense (therefore the job of the Air Force) or artillery (therefore Ordnance)? Extreme example: Wings on Ordnance missiles are "lifting surfaces"; wings are for planes, i.e., A.F.

German planning and philosophy is still strong. Dependence on captured data and scientists has eased us into the same ideas for the defense of the Third Reich. Are conditions the same here and now?

**Where Are We?** Missile-less, for sure. Not tomorrow, but the day after is the time to look for missiles. For four years, military and civilian leaders have been saying that missiles are coming soon. They aren't.

**Fact:** Today's missile program status in the U.S. is not greatly advanced over Germany's in 1945. We still lack any operational experience in the field.

**Prediction:** Air-to-air missiles will not be combat-ready before 1955; accurate, reliable anti-aircraft missiles until 1957; long-range missiles until 1960, if then.—DAA.





AUGUST 1953 / 35 CENTS

# Air Trails®

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING



Father of Flight:

**Santos-Dumont**

the Brilliant Brazilian

Cat's Whisker Stunt Model

**B-57A Bomber Cutaway**

"Blow Bug" Turbine Jet Model

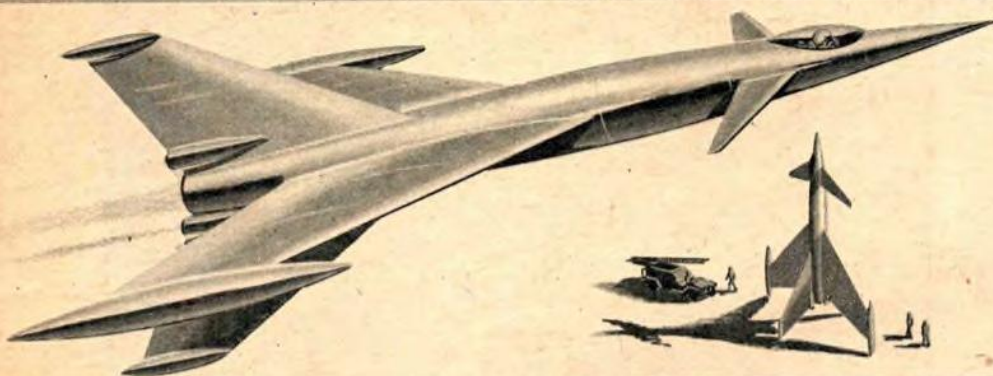
IN  
THIS  
ISSUE... **"DIID"** THE AIR  
ATTACK  
Game!

CAL SMITH



# 1ST AWARD

## Rocket and turbojet interceptor-fighter



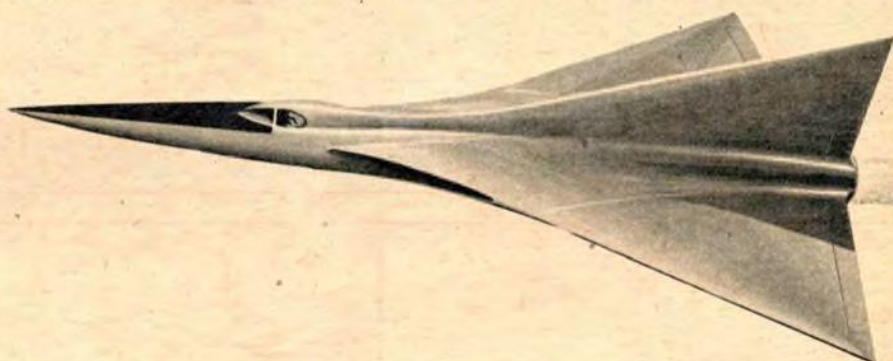
An interceptor-fighter by R. W. Flint of Los Angeles, Calif., capable of taking off and landing vertically. Powered by one 8000 lb. thrust turbojet in fuselage and two rockets of 8000 lb. thrust each. Pilot lies prone in pressurized cockpit. Vertical take-off, using all powerplants. Rockets are shut off as soon as sufficient altitude is gained and horizontal flight assumed. For landing, umbrella dive brake located between horizontal stab and wings is used together with split flaps in wings and rockets fired up to check rate of descent. Armament four 20 mm cannon.

# 2ND AWARD

## Ramjet high-speed research plane

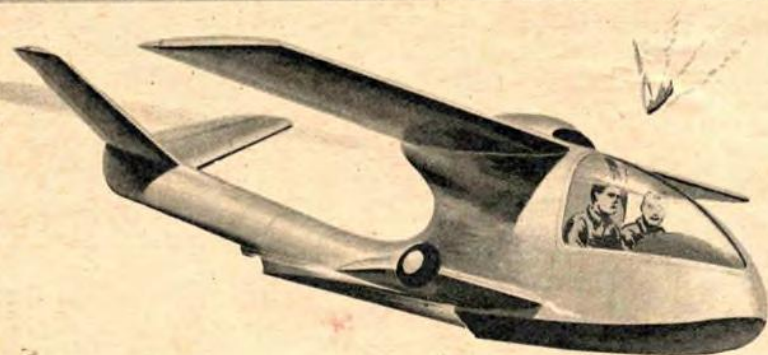


Delta wing research speed plane by David Morton of Kansas City, Mo. Can be powered by either ramjet or rocket engine. With former, the initial speed after take-off is attained by the use of jato inasmuch as ramjet does not develop any appreciable power until the speed reaches at least 300 mph. Speed with ramjet is estimated at 2000 mph, with rocket 3000 mph. Climbs to 65,000 ft. in 2 minutes. Plane carries 10 minutes of fuel. Bicycle l.g., wingtip wheel skids.



# 3RD AWARD

## Two-place light jet-powered amphibian



A clever little two-place amphibian powered by an 880 lb. thrust jet engine, designed by Ain Sonin of Toronto, Canada. The "V" type tail surface can be lowered to assume horizontal position, thus preventing the ship from weathercocking when taxiing—a characteristic of seaplanes with large fin areas. When landing on land, both sponsons are lowered with wheels assuming vertical position. Note the moulded Plexiglas cockpit canopy which gives the little amphibian an excellent all-around vision. Span of this neat-looking, versatile craft is 42 ft.

## AIRMEN OF VISION DESIGN COMPETITION

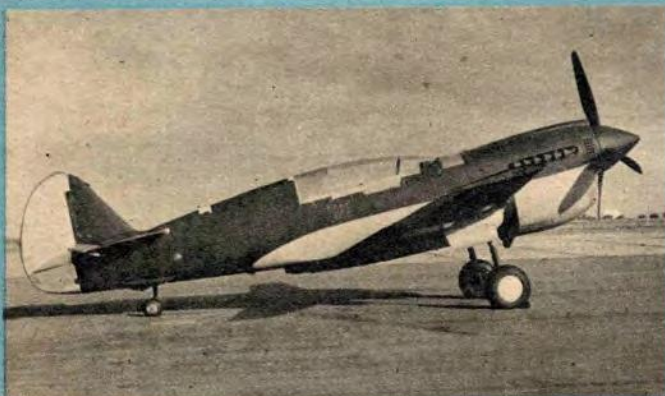
Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the powerplant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.





USAF KB-29 tanker refueling F-84's and an F-80. System developed by Flight Refueling Ltd. consists of hose and funnel-shaped drogue in streamlined pods in wingtips and fuselage reeled out for refueling.



An old warrior in new dress. A Curtiss P-40 acquired by midget race plane pilot Robert Downey and modified for air racing. Streamlined cockpit canopy cuts down drag. Downey flew famous Minnew in '51.



Latest French military plane, the twin-jet all-weather fighter-bomber Sud-Ouest SO-4050 Vautour. Capable of sonic speeds, will be an important NATO aircraft. Powered by two 6000 lb. thrust ATARS.



Dornier's big YH-31 evacuation ambulance helicopter, minus cab. Only helicopter with four-bladed rotor. Powered by 400 hp. Lycoming. Commercial version to be known as LZ-5 will carry ten passengers.

# Air

## FORECAST and REVIEW

**Light Fighters: Possible?** Watch this new controversy—it's loaded. Object: to get military to specify, and industry to develop a fighter that can outfly—as well as outfought—the MiG. Industry and military are split down the middle, can't even agree on the need for such a plane. One extreme: a stripped-down, light, small fighter with minimum equipment, maximum performance. Other extreme: large complex fighting machine with maximum equipment *plus* maximum performance. Current trend is still towards latter, but some designers are trying ways to make them less complex. Final answer may never come, but much will be learned along the way. Question: Do you want to beat the enemy on the basis of individual hits, or on the final box-score? Prediction: There won't be any light fighter, but there will be less-complex big ones.

**New Planes:** North American F-86H Sabre has 9,000-lb. thrust G.E. J-73 t'jet, is bigger and heavier than type now in Korea. New Sabre will slash enemy from two positions: fighter-bomber and day fighter. Indication: Current Sabre is being phased-out as first-line fighter, to be replaced by F-86D all-weather type or later types. . . . New heavyweight is Douglas C-132 designed around 100,000-lb. payload. Class designation: logistics carrier; will tote anything it can lift and act as aerial resupply line. Powerplants are reported to be Pratt & Whitney turboprops of 15,000 hp each. . . . Take-off with the prop feathered? That's what the experimental McDonnell XF-88 modification does. It's being used as a flying testbed for Allison T-38 turboprop; main powerplant is two Westinghouse J-34 jets, used during take-off, landing and routine flight. Purpose of tests: gather data for high-speed turboprop attack plane. . . . Republic's F-84H turboprop modification should be flying by now at Edwards AFB. Three are being built, around the Allison T-54 engine. USAF and Navy sponsor the program jointly, will get results on three prop systems: Curtiss, Aeroproducts and Hamilton Standard.

**Shape of Research Problems** and program to lick them was spelled out by National Advisory Committee for Aeronautics at biennial inspection tour for industry. NACA is in over its head on the problems of transonic flight, sees no relief in sight as industry continues to demand more and more data in that turbulent speed range. Reason for demand: lack of adequate theory to solve mixed subsonic and supersonic flow patterns. Only test data can do job. One fact emphasizes need for accurate tests: A tiny difference in drag can cause huge speed difference. Host of new stability and control problems are being studied over speed range from zero through high supersonic.

**Other NACA Studies:** Crash fires. War-weary C-82 and C-46 planes were loaded with fuel, started up and guided down a ramp to crash into barrier rigged to rip tanks open. Motion pictures of crash and fire led to development of inerting system which could be worth its weight in gold in future craft. Fires were kept from starting by system which cut off all electrical services, squirted extinguisher into engine intakes and sprayed water on exhaust rings. . . . Hydro-skis—used by planes for water take-offs—were one byproduct of ditching studies. Dangerous plunging of some aircraft was stopped by use of retractable ski on under surface. Other tests showed ski was useful for take-off, too. Now future fighters and transports will be able to operate from mud, ice, snow, water, muskeg and wet grass. . . . "Flying Venetian blind" was popular—and wrong—name given to research tool



demonstrated in hovering flight at NACA. Four curved wings deflect slipstream from four props downward, produce vertical thrust equal to plane's weight. Thus, hovering. NACA is trying to find what kind of stability and control problems you have at very low forward speed, uses the "blind" as matter of convenience. Overzealous newspapermen picked up weird study configuration of the "blind," billed it as aircraft of the future. But basic idea has been known and understood for at least 30 years.

**Turboprops Are Better** for U.S. airlines, says C. R. Smith, president of the biggest, American Airlines. He sees such liners as more economical and more efficient than turbojet craft, faster by 100 mph than DC-7 or Super Connie. But we need: solutions for problems of gearbox, props, controls; new kind of prop to use the 7,000 hp Smith expects from tomorrow's turboprops.

**More on Missiles:** Production Martin Matador (B-61A) features high wing, horizontal tail dihedral. Streamlined fairing covers intersection of vertical and horizontal Tee-tail. Pre-production types had midwing, no dihedral. . . . Interservice row is coming up on responsibility for U. S. missile program. Army wants in on strategic bombing, claims it's just an extension of artillery; USAF and Army both want anti-aircraft job exclusively. This is unification? And maybe with the Navy as referee?

**Destruction of X-2,** Bell's supersonic stainless-steel rocket research plane was final blow to an often-and-long delayed program. Intended to carry on from where X-1 left off, the bigger swept-wing X-2 was powered by a variable-thrust Curtiss rocket engine. Powerplant delays—caused by somebody's optimism on the tough problems of getting rocket engine to work like any other engine and respond to throttle action—dogged the X-2, which was completed long before bugs were out of engine. Called "world's heaviest glider" by some during engineless wait, the X-2 was just about ready for first flights when explosion blasted it loose from mother B-50 over Lake Ontario. Bell pilot "Skip" Zeigler and flight test engineer Frank Wolko were lost in accident.

**Nuclear Power:** Negative. Atomic aircraft programs—one with Convair airframe, G.E. engine, the other a study contract with Boeing and Pratt & Whitney—will be cut back to study and research projects with minimum of hardware. Pentagon officials suggest any time lost now can be more than made up later by enterprising American industry. From competent industry and technical observers, this drew only a dirty laugh. The fact: No company, or group of companies, could afford the money required. And you never can buy time. Thus, atomic aircraft program is being sabotaged by the very people whose lives may depend on that program. So is other basic research.

Also in Washington, five senators, a subcommittee of Armed Services Committee, will investigate waste, inefficiency and duplication in all U.S. aircraft programs. . . . Undersecretary of Defense Roger Kyes assures aircraft industry of continued good health, no shutdown like that just after World War II. We'd feel better if assured of continuation of basic research, the lifeblood of tomorrow's progress.

**NATO Target:** 1,500 first-line jet fighters in service by end of 1956. To reach that goal, European plants are tooling up for these airplanes: Hawker Hunters in England, under license in Belgium and Holland; Hawker Sea Hawks and Supermarine Swifts in England; Dassault Mystères in France; and North American F-86Ds in Italy. Last of these is big surprise, because all earlier talk has been around production of Gloster Javelin all-weather fighter. Officials decided that F-86D was nearer a production item than Javelin, gave it the nod.—DAA



Navy's newest helicopter, Kaman HO4S, is for general utility and ambulance service. Powered by 500 hp nine-cylinder radial Continental engine. Servo-flaps on intermeshing rotors give hands-off stability.



Sud-Ouest SO.95 equipped with bicycle type landing gear. This is a test aircraft on which gear was perfected prior to installation on Vautour twin-jet fighter. The gear itself built by Hispano-Suiza firm.



Thalman T-4, wood, plastic and aluminum 4-place personal plane built by H. J. Thalman of Salt Lake City. Has retractable gear, 135 hp Lycoming engine buried in fuselage nose. Cruising speed is 150 mph.



Chase C-123B, production version of the Avitruc. Has increased tail area over earlier model, 3200 lbs. more weight. To be built as commercial plane with Wright turbo-compound and Allison turboprop engines.



OCTOBER 1953/35 CENTS

# Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Aviation  
and  
**MODEL  
PLANES**

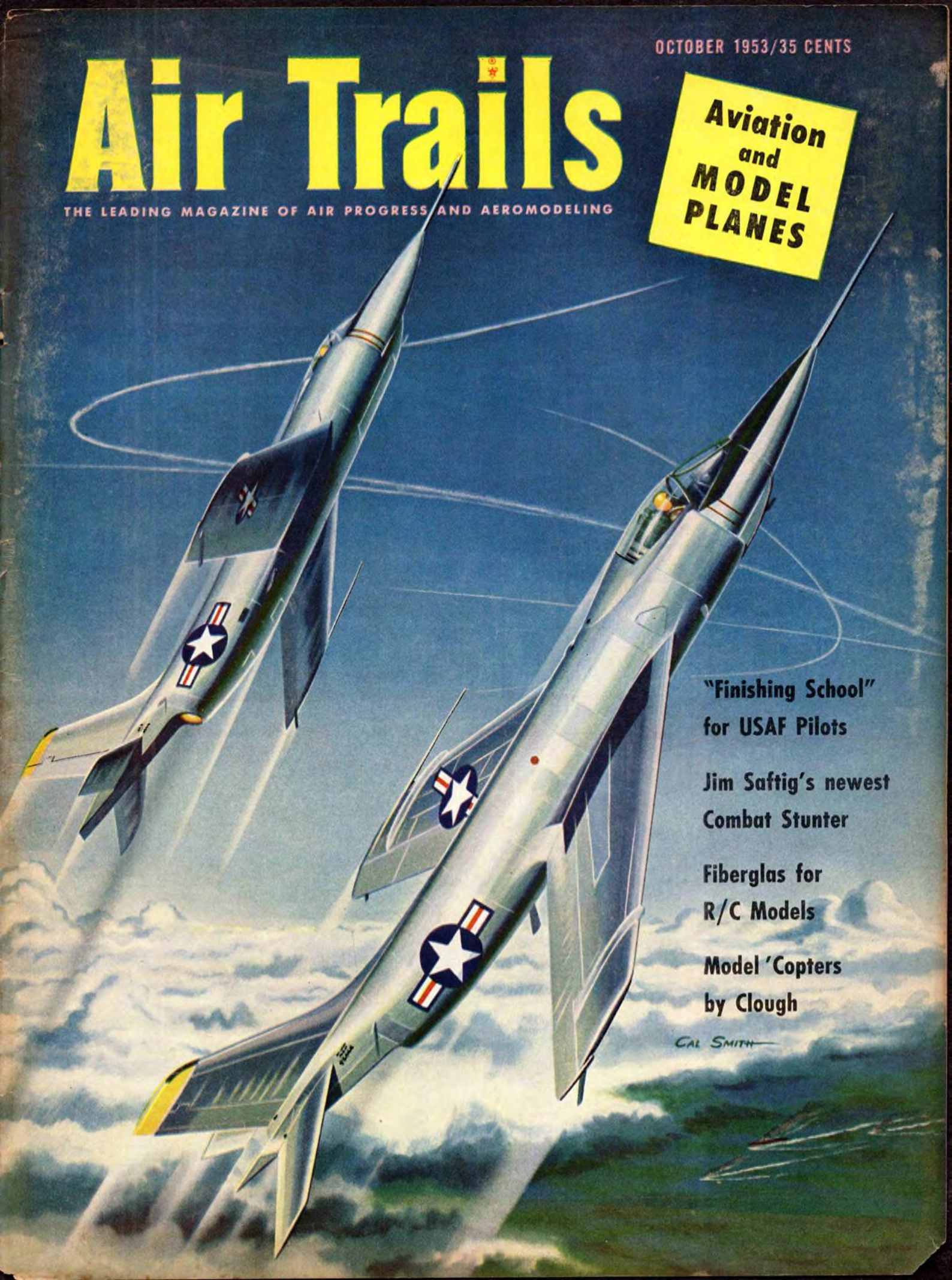
**"Finishing School"  
for USAF Pilots**

**Jim Saftig's newest  
Combat Stunter**

**Fiberglas for  
R/C Models**

**Model 'Copters  
by Clough**

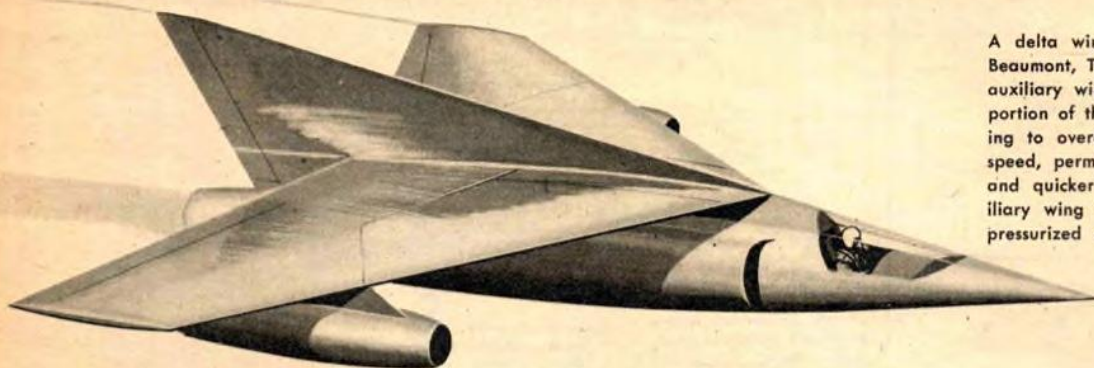
CAL SMITH





## 1<sup>ST</sup> AWARD

### Slip-wing delta high-altitude fighter



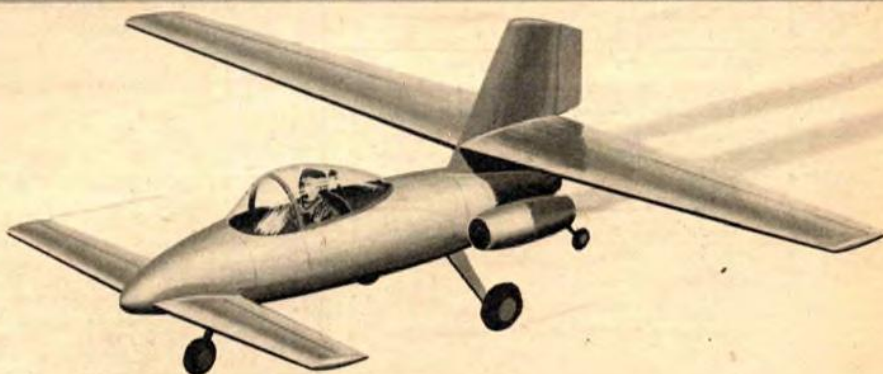
A delta wing jet fighter by George Talbert of Beaumont, Texas. The plane is equipped with an auxiliary wing which swings out of the forward portion of the main supporting surface, thus adding to overall wing area and reducing stalling speed, permitting plane to make slower landing and quicker take-offs. For high speed, the auxiliary wing is retracted. The plane has a fully pressurized and air-conditioned cockpit. Powered by a 6000-lb. thrust turbojet and two ramjets at wingtips, it is capable of speeds in neighborhood of 850 mph. Has ceiling of 75,000 ft.

## 2<sup>ND</sup> AWARD

### Light jet-powered canard sport plane

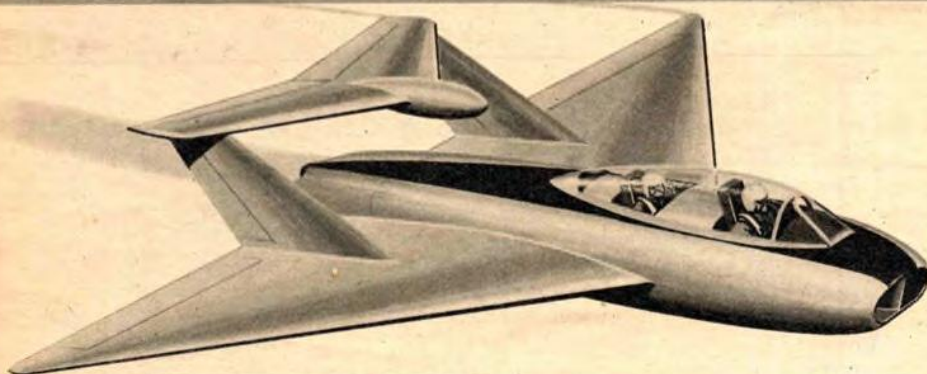


An unusual single-place sportplane by Samuel N. Reighard of Evans City, Pa. Original design somewhat altered by our technical staff by lowering main wing and relocating powerplants. Engines: two 200 lb. thrust turbojets. Designer claims unusually short take-off of only 80 ft. run and ability to maintain flight at speed as low as 50 mph. Cruising speed is 120 mph, top speed 160 mph. Construction is all metal, tail surfaces, ailerons and flaps fabric covered. Landing gear swivels, permitting cross-wind landing. Auxiliary tip tanks can be fitted for extra range in case that is desired.



## 3<sup>RD</sup> AWARD

### Radar-equipped delta wing jet fighter



An all-weather fighter by Wayne Moore of Grand Prairie, Texas. Quite interesting is the location of the horizontal tail, atop the two rudders, with radome in center of stabilizer. This permits a good unobstructed nose air intake for the two 7200 lb. thrust engines. Crew consists of pilot and radar operator seated in large-canopied, fully pressurized cockpit. Armament is six cal. .50 machine guns and rockets. Wingspan is 42 ft. 6 in., length 37 ft. 5 in.; maximum speed of this fighter is in excess of 700 miles per hour.

## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

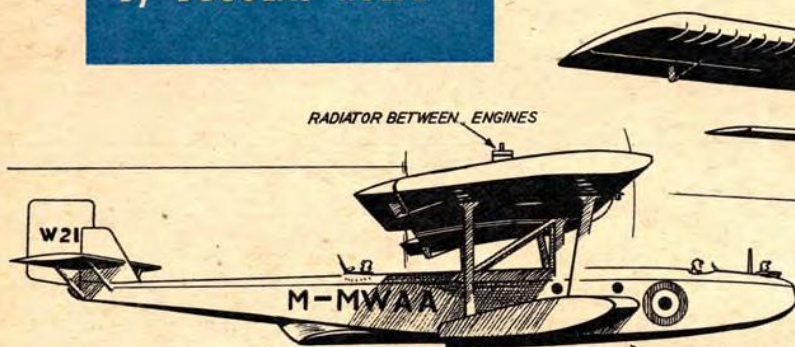
commercial aircraft, military planes, (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



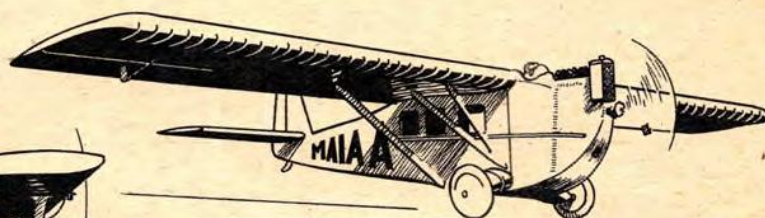
# AIR PROGRESS

By DOUGLAS ROLFE

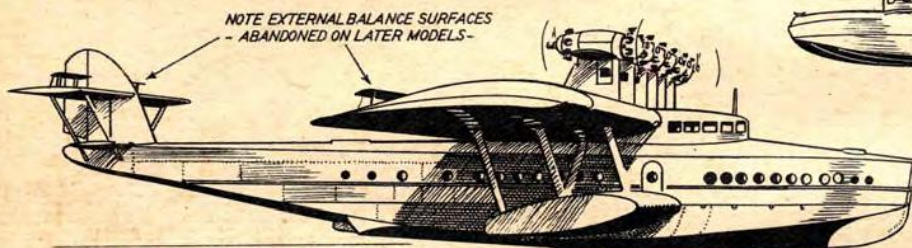
## THE DORNIER STORY



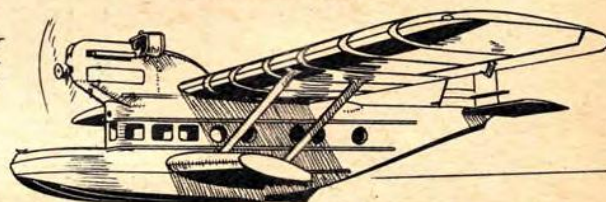
1923 DORNIER PROTOTYPE WAL (TWO 300 H.P. HISPANO-SUIZA ENGINES MOUNTED IN TANDEM ABOVE THE WING). THE SAME GENERAL DESIGN IS RECOGNIZABLE IN ALL SUBSEQUENT DORNIER BOATS



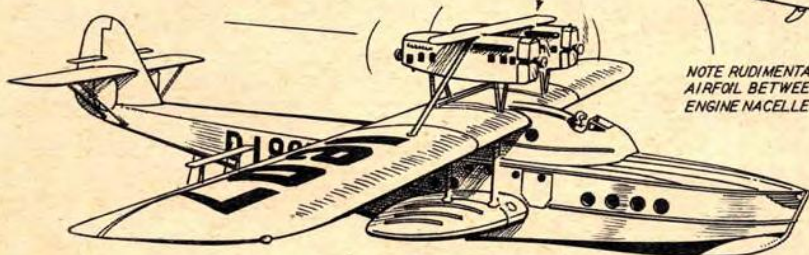
1922 DORNIER KOMET (185 H.P. B.M.W. ENGINE). THIS 6-PASSENGER TRANSPORT WAS ONE OF DR. DORNIER'S FIRST ALL-METAL COMMERCIAL DESIGNS AND FLEW WELL



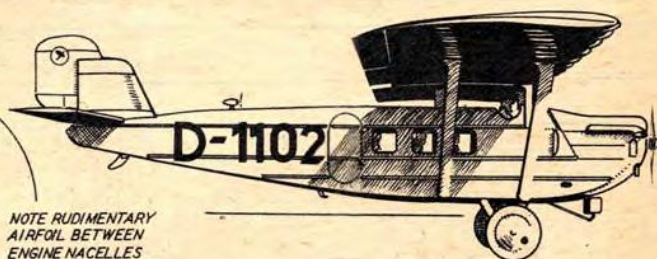
1929 DORNIER Do.X (TWELVE 550 H.P. SIEMENS—LATER, TWELVE 615 H.P. CURTISS ENGINES) ALTHOUGH DESIGNED TO SEAT 72 PASSENGERS IT ONCE CARRIED 150 PASSENGERS. A CREW OF 10 AND 9 STOWAWAYS! IT WAS FIRST PLANE IN THE WORLD WITH A FLIGHT DECK AND A CREW WHICH INCLUDED A FLIGHT ENGINEER



1928 DORNIER DELPHIN (600 H.P. B.M.W. ENGINE)... 9-PASSENGER CIVIL TRANSPORT

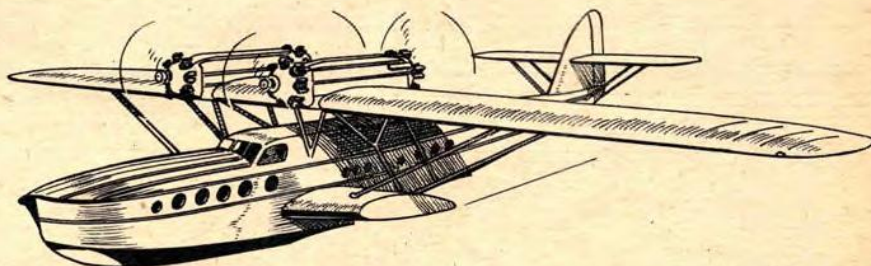


1930 DORNIER Do.SUPER-WAL (FOUR 600 H.P. HISPANO-SUIZA ENGINES) THIS 22 PASSENGER BOAT WAS THE SMALLER SISTER OF THE Do.X. (TOP SPEED 127 M.P.H.)



1930 DORNIER MERKUR (600 H.P. B.M.W. ENGINE) 6-8 PASSENGER CIVIL AIRLINER. MAXIMUM SPEED WAS 120 M.P.H.

1932 DORNIER Do.S BLAUWAL (FOUR 550 H.P. BRISTOL JUPITER ENGINES) A CONSIDERABLY CLEANER VERSION OF THE PRECEDING WALs WITH ENGINE NACELLES BEDDED DOWN INTO THE WING AND UPPER RUDIMENTARY WING ELIMINATED



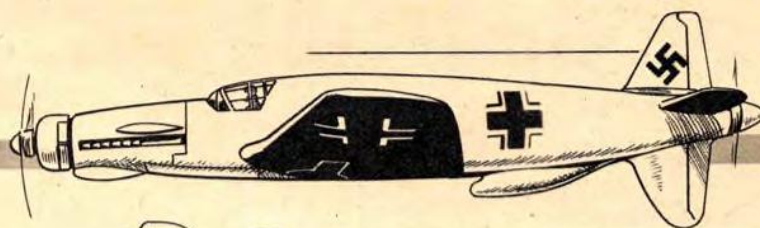
Dr. Claude Dornier of Germany was one of the earliest exponents of all-metal construction for aircraft—a result of his one-time association with the Zeppelin Werke in Friedrichshafen, which supported his efforts, and consequent exposure to Count Zeppelin's well-known views on the subject of metal construction. In any event Dornier runs Junkers a close second in developing this form of construction for airplanes, and is second to none in regard to the pioneering of

really big airplanes.

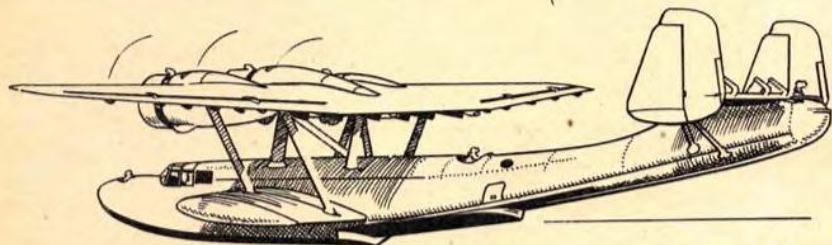
In 1922, the firm which was known as Zeppelin Werk Lindau G.M.B.H., changed its name to Dornier Metallbauten, and at first turned out a series of shoulder-wing civil transports that were, for the period, excellent aircraft. Early models had a unique cantilever landing gear which offered minimum drag. The "Wal" series of boats followed, and with various modifications and improvements



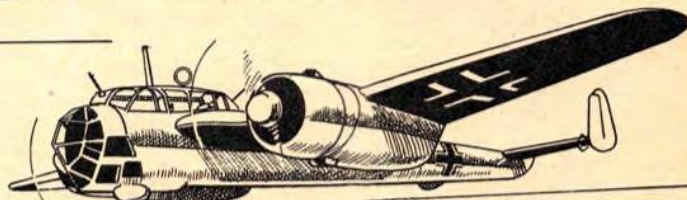
One of the first German aircraft firms, pioneers of large planes, all-metal structures



1945 DORNIER Do.335 (TANDEM ENGINES; TANDEM PROPS). ONE OF THE LAST DORNIER DEVELOPMENTS BEFORE THE CRASH OF THE THIRD REICH HALTED DORNIER PRODUCTION. VERY FAST (477 M.P.H.), IT WAS A FIGHTER AND RADICALLY DIFFERENT FROM DESIGN ANGLE



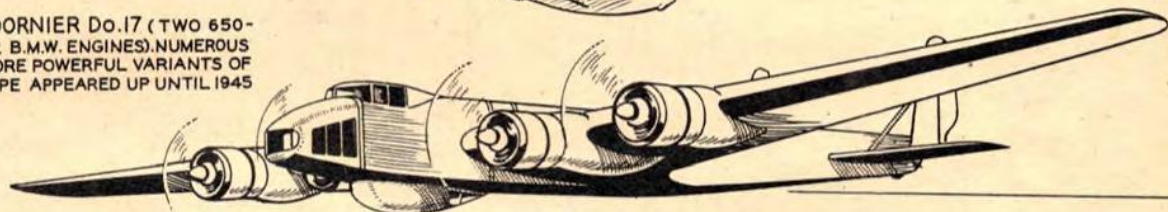
1942 DORNIER Do.24 (THREE 880 H.P. B.M.W. ENGINES) THIS AND THE FOUR-ENGINE Do.26 WERE FINAL DEVELOPMENTS OF THE Do.WAL



1939 DORNIER Do.17z (TWO 1,000 H.P. BRAMO 323 RADIAL AIR COOLED ENGINES) WAS PREDECESSOR OF THE FAMOUS 217 SERIES EXTENSIVELY USED BY LUFTWAFFE



1938 DORNIER Do.17 (TWO 650-750 H.P. B.M.W. ENGINES). NUMEROUS AND MORE POWERFUL VARIANTS OF THE TYPE APPEARED UP UNTIL 1945

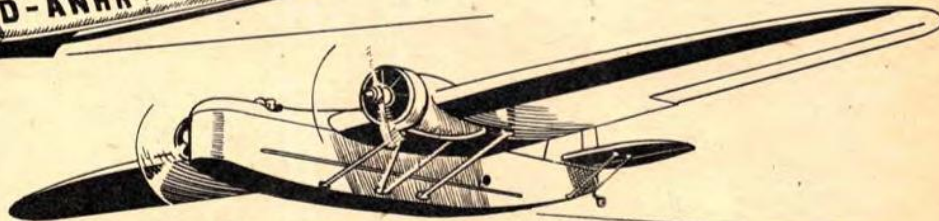


1938 DORNIER Do.19 (FOUR 650 H.P. BRAMO ENGINES). PRE-WAR HEAVY BOMBER OBSOLESCENT WHEN WAR BEGAN

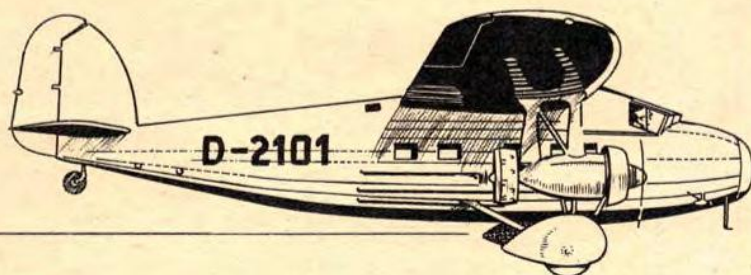
DOUGLAS  
ROLFE



1938 DORNIER Do.18E. TWO 510 H.P. JUNKERS JUMO ENGINES). CIVIL AND MILITARY BOAT. ESTABLISHED A NEW LONG-DISTANCE RECORD (5,220 MILES)



1934 DORNIER Do.F (TWO 550 H.P. SIEMENS ENGINES). THIS AIR FREIGHTER CARRIED A USEFUL LOAD OF 4,400 POUNDS AT 137 M.P.H., HAD A PARABOLIC WING SIMILAR TO THAT OF THE Do.K AND WAS FIRST DORNIER WITH A RETRACTING LANDING GEAR



◀ 1932 DORNIER Do. K (FOUR 240 H.P. WALTER ENGINES). 10-PASSENGER TRANSPORT WITH PARABOLIC (SCIMITAR) WING. CRUISING SPEED WAS AROUND 124 M.P.H.

remained one of the best Dornier types until the collapse of Germany in World War II.

The early "Wal" flying boats hung up many outstanding records and made North and South Atlantic crossings. The enormous Do. X, itself a greatly enlarged version of the standard Super-Wal, was probably the first practical giant plane to be built. A number of these huge craft were produced and at least one completed two

Atlantic crossings.

During the Hitler war Dornier made notable contributions to the Nazi cause with highly efficient day and night bombers, attack and dive bombers. Several versions of the curious Do. 335 were built, including night fighters, fighter-bombers and a two-cockpit trainer. All resembled the model shown—which came out too late to take part in the conflict.



DECEMBER 1953 / 35 CENTS

# Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING



Plymouth Internationals  
in Pictures!

"Sketchbook" at  
the Nationals

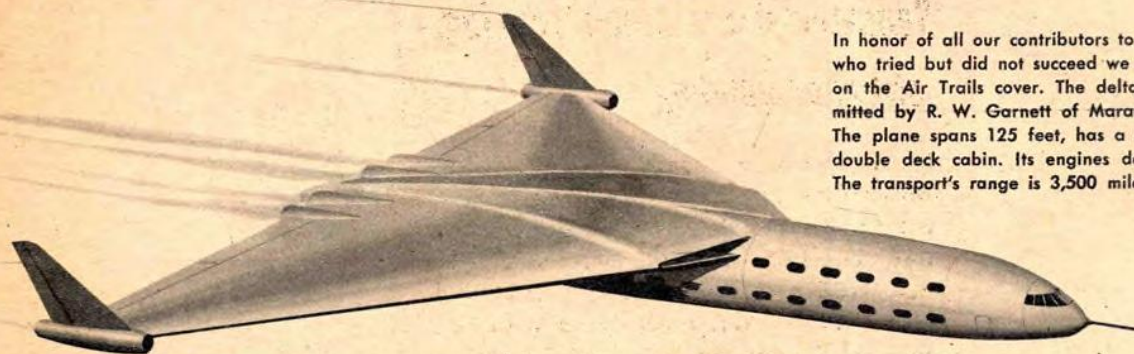


CAL SMITH

Cal Smith's JERSEY LIGHTNIN'  
RADIO CONTROL MODELPLANE RACER



# 1<sup>ST</sup> AWARD Six-Jet Delta Wing Transport Plane

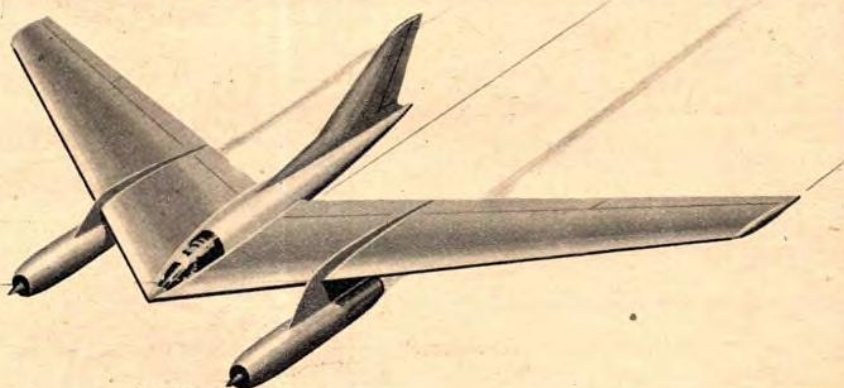


In honor of all our contributors to Airmen of Vision including those who tried but did not succeed we are featuring this month's winner on the Air Trails cover. The delta wing, six-jet transport was submitted by R. W. Garnett of Maracaibo, Venezuela, South America. The plane spans 125 feet, has a capacity of 68 passengers in the double deck cabin. Its engines develop 7,200 lbs. of thrust each. The transport's range is 3,500 miles and maximum speed 550 mph.

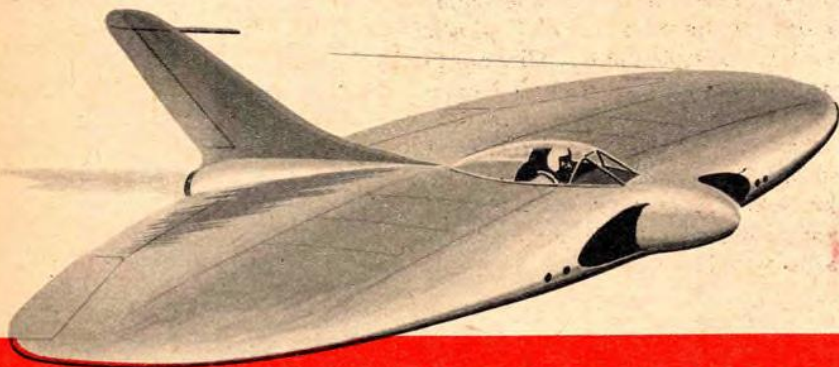
# 2<sup>ND</sup> AWARD Ramjet Interceptor



High-speed, semi-flying wing interceptor by Don Dale of Minneapolis, Minn. It is powered by two ramjet engines suspended below the wings, and rockets which give the plane its initial boost and bring it up to speed where the ramjets become efficient. The pilot lies prone in pressurized and air-conditioned cockpit, to give him higher "G" tolerance during maneuvers and to reduce frontal resistance. Wing fences, formed by upward extension of nacelle suspension, slow up the outward progression of stall. Wingspan of the plane is 50 ft., and the top speed around 800 mph.



# 3<sup>RD</sup> AWARD Flying Saucer Sonic Fighter



Design submitted by Lawrence K. Benson, Jr., and Charles R. Howard of New Orleans, La. The Flying Saucer was designed as a day interceptor and fits the modern concept of the very light, simple but effective fighter with minimum of electronic equipment, cheap in price and easy in maintenance. The wing shape is interesting. It is circular, which gives plenty of area for a comparatively small span, the span in this case being 24 ft. The engine is a 7000 lb. thrust turbojet assuring the Saucer a maximum of over 750 mph. The range is 850 miles. Armament consists of four 20-mm cannon. Leading edge of wing has slots. Escape hatch in bottom of fuselage.

# AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type,

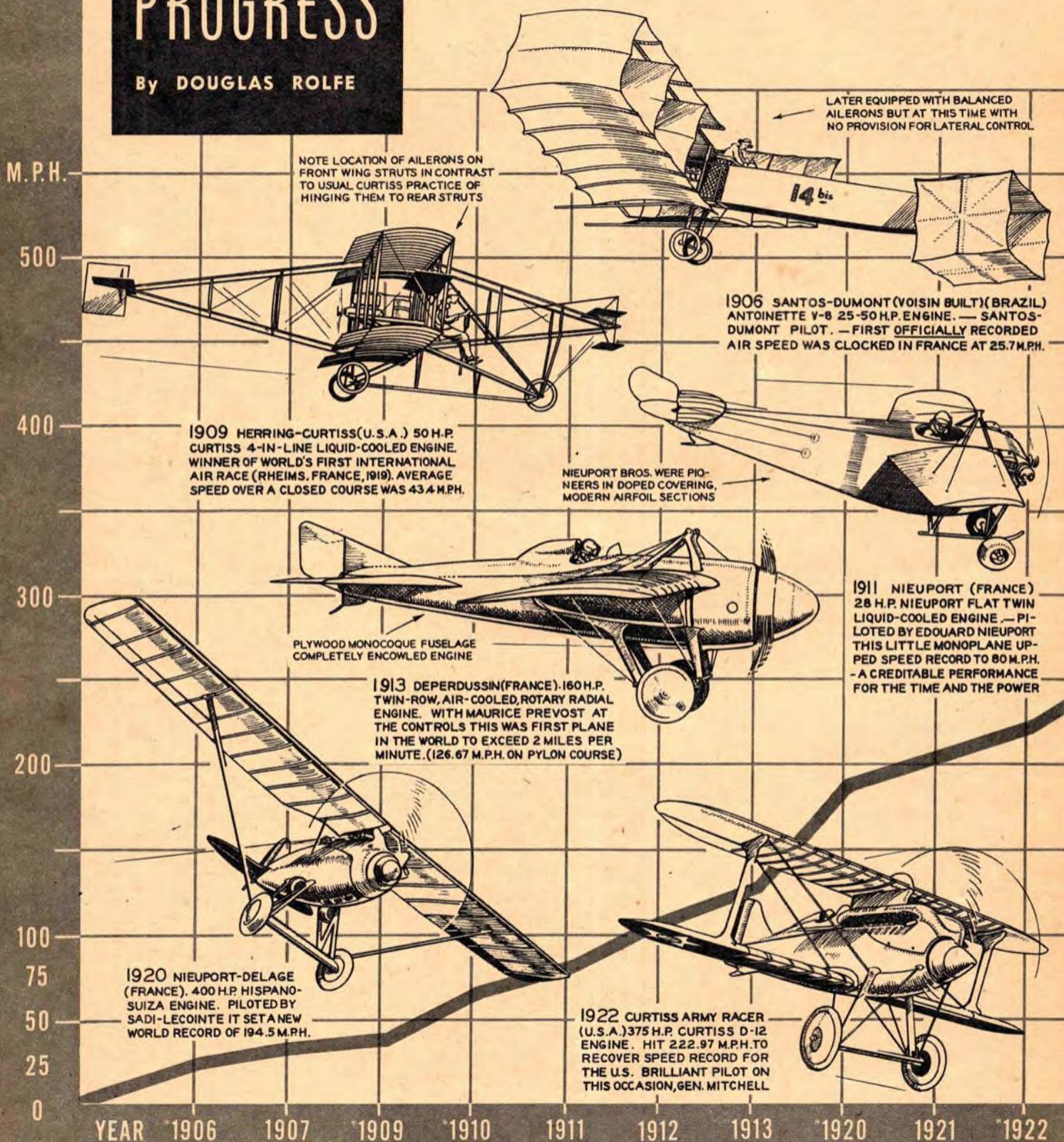
commercial aircraft, military planes, (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



# AIR PROGRESS

By DOUGLAS ROLFE

## The Quest for Speed



With the airplane celebrating its fiftieth birthday this December, it is fitting to look over what man has accomplished in the way of air speeds. All the figures quoted on these pages are taken from officially recorded world's speed records and present in graph form the astonishing mounting curve from 1906 on.

Superimposed against the speed graph are a few of the more important designs which contributed to the record.

Actually close to 500 miles per hour speed by the piston engine plane was achieved around 1931. This seems to be about the limit for this type of airplane, although it may be noted that 500 mph speeds are now considered operational for service aircraft; whereas the 1931 high-speed mark was obtained with a special and completely experimental type of racing plane.

The advent of the jet engine has sent the speed of the



1953 NORTH AMERICAN F-86 SABRE (U.S.A.) G.E. TURBO-JET ENGINE. — JACQUELINE COCHRAN, PILOT. — 670 M.P.H. LATEST RECORD—715.7 MPH BY LT. COL. W.F. BARNS FLYING F-86D

FASTEST PILOTED AIRCRAFT IN THE WORLD TO DATE ('53) DOUGLAS ROCKET-POWERED 558 SKYROCKET.—1,234 M.P.H. WITH BILL BRIDGEMAN PILOTING

1945 GLOSTER METEOR IV (GT. BR.) TWO ROLLS-ROYCE DERWENT JETS, TOTAL THRUST 7,000 LBS. 606 M.P.H.

RADIATORS

▲ TWO DECISIVE HIGH-POINTS IN PISTON-ENGINE SPEED DESIGN  
LEFT: THE SUPERMARINE S.6B (GT. BR.) 2,300 H.P. ROLLS-ROYCE ENGINE.—406.99 M.P.H. (1931). SQDN. LEADER ORLEBAR, PILOT  
ABOVE: MESSERSCHMITT B.F. 109 R (GER.) 900 H.P. (BEEFED UP TO 1300 H.P.) DAIMLER-BENZ ENGINE. RACING VERSION OF THE ME 109 IT CLOCKED 469 M.P.H. OFFICIALLY, 497 M.P.H. UNOFFICIALLY IN 1939

ASTERISK INDICATES PLANES ILLUSTRATED HERE

RADIATORS

RADIATORS

1923 CURTISS NAVY RACER (U.S.A.) CURTISS CD-12 ENGINE. AL WILLIAMS, PILOT.—266.59 M.P.H.—THE CURTISS RACERS OPENED UP ENTIRELY FRESH CONCEPTS ABOUT HIGH-SPEED FLIGHT.

1924 S.I.M.B. FERBOIS (FRANCE) 450 H.P. HISPANO-SUIZA ENGINE. WARRANT OFFICER FELICIEN BONNET PILOTING.—278.48 M.P.H.

1923 1924 1927 1928 1929 1931 1933 1934 1939 1945 1953

airplane soaring upward. In the eight years which have elapsed since the British Gloster Meteor passed the 600 mile mark, over 100 mph have been added to the official record. Though this may appear slow progress at first glance, one must consider the fact that the rate of increase in aircraft speed per year from 1903 to 1948 was only 14 mph. To maintain this rate as the speed of sound is approached becomes a tremendous effort due to extremely

high increase in drag and the consequent need for engines of very high propulsive power.

What the future holds is anyone's guess. The 1200 mph speed of the Douglas Skyrocket—purely an experimental craft—affords some idea of what we may expect when the jet and the rocket engines are fully developed and the problems of various kinds surrounding supersonic flight have been fully solved.



# Air Trails®

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

JANUARY 1954 / 35 CENTS



Outstanding control scale model:

**TRIMMER AMPHIBIAN**

Rolfe's famous Air Progress sketches:

**THE HEINKEL STORY**

Air-Model Manual:

**ENGINE SPEED CONTROL**

True Story of Von Richthofen's last flight:

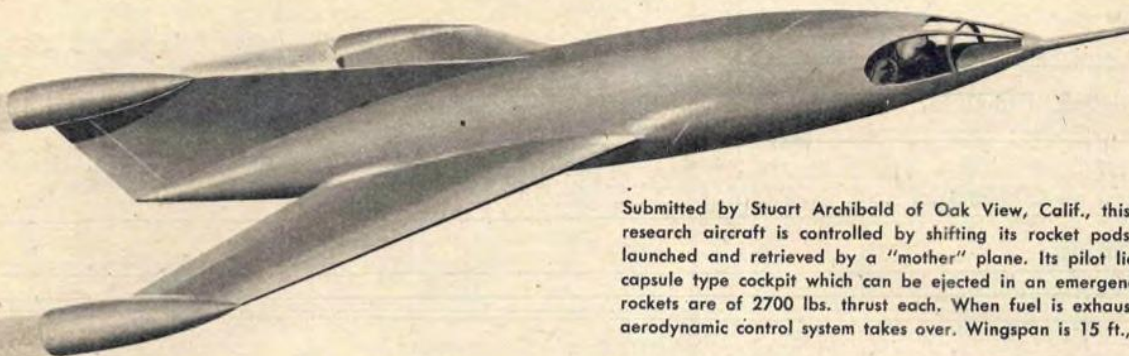
**THE DAY THE BARON DIED**

Unique Half-A free flight:

**SWAYBACK by Tom Henebry**



## 1<sup>ST</sup> AWARD High-Altitude Experimental Airplane

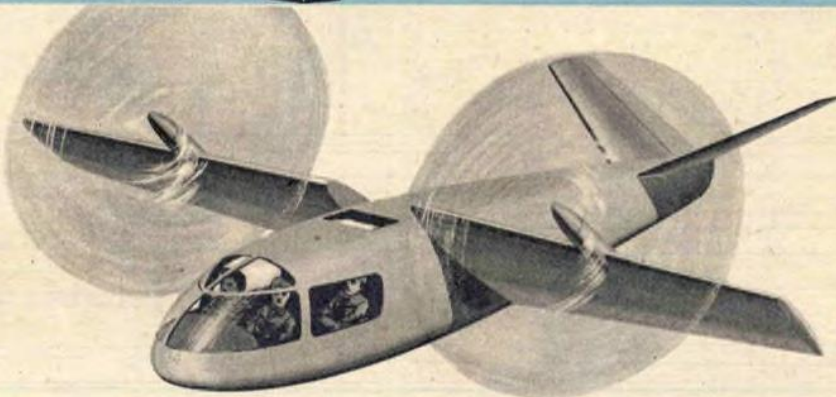


Submitted by Stuart Archibald of Oak View, Calif., this high-altitude research aircraft is controlled by shifting its rocket pods. The craft is launched and retrieved by a "mother" plane. Its pilot lies prone in a capsule type cockpit which can be ejected in an emergency. The three rockets are of 2700 lbs. thrust each. When fuel is exhausted, standard aerodynamic control system takes over. Wingspan is 15 ft., length 25 ft.

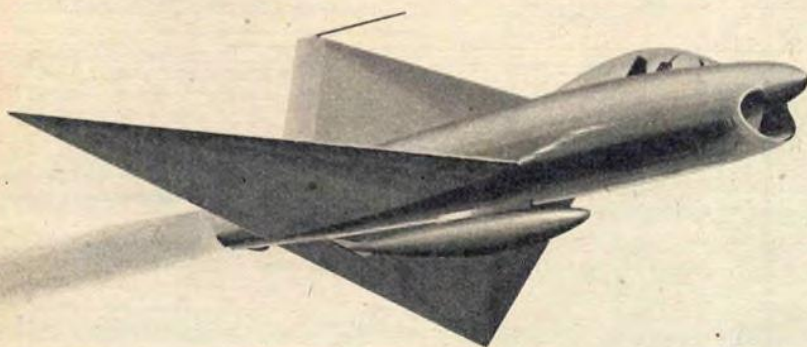
## 2<sup>ND</sup> AWARD Turbine-Powered Convertiplane



Convertiplane by Paul F. Torbin of Rapid City, N. Dak. Entire wing with "rotoprops" rotates 90 degrees for either vertical take-off or fixed-wing airplane flight. Wing has "flaperons" which act as either flaps or ailerons. Power is supplied by a 500 hp turbine located in the fuselage and using exhaust thrust augmentation. Full power is utilized for helicopter flight, half-power as conventional plane. Plane carries four, including pilot. Span is 34 ft., length 31 ft., top speed 200 mph, range 350 miles. Rotor-prop diameter 10 ft. 6 in.



## 3<sup>RD</sup> AWARD Delta Wing All-Weather Interceptor



Delta interceptor by Peter J. Butkewicz of Dunmore, Pa. The plane has a wingspan of 32 ft. 8 in.; length 45 ft. It is powered by a 4000 lb. thrust axial flow jet engine. For longer range it is equipped with an auxiliary fuel tank which can be dropped. Has search radar and electronic gunsight, and armament consists of 18 rockets of 4.5 in. diameter. The cockpit is armor-plate, pressurized, and can be jettisoned in event of emergency. Plane has dive brakes in rear section of fuselage similar to those of the Sabre. Top speed 800 mph.

## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes, (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.





World's first jet-powered aerial tanker, Boeing KB-47 refueling a B-47 Stratojet. System is "probe and drogue" developed by Flight Refueling, Inc. Converts from bomber to tanker in few hours.

Fairey V.T.O. (Vertical-Take-Off) delta wing model tested at the Australian Woomera Rocket Range. Powered by Fairey-developed Beta rocket which has two 900 lb. thrust nozzles. Tests conducted to explore possibility of slow acceleration vertical launch.



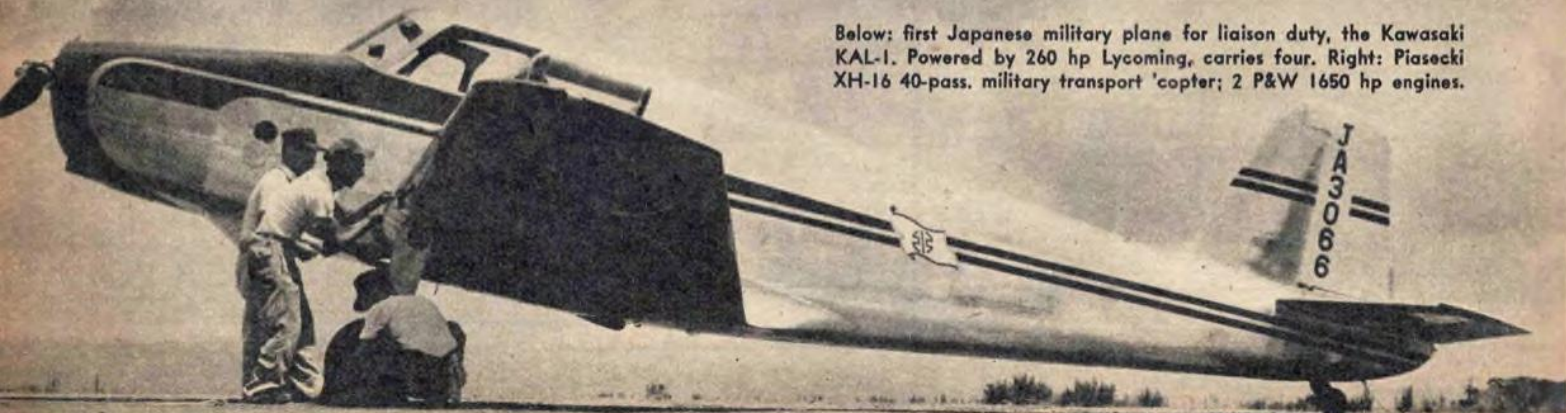
## Where those PLANE

■ "Sky" is reserved and so is the "spirit-world." You can't use "fire" and you can't use "cat."

This isn't quite as mysterious as it sounds. It means simply that a series of names for future airplane models has been reserved by certain manufacturers. For instance, the Douglas Company has had the "sky" series assigned to it and its models are variously named Skyknight, Skyraider, Skyray, Skyshark, Skytrain, and Skytrooper.

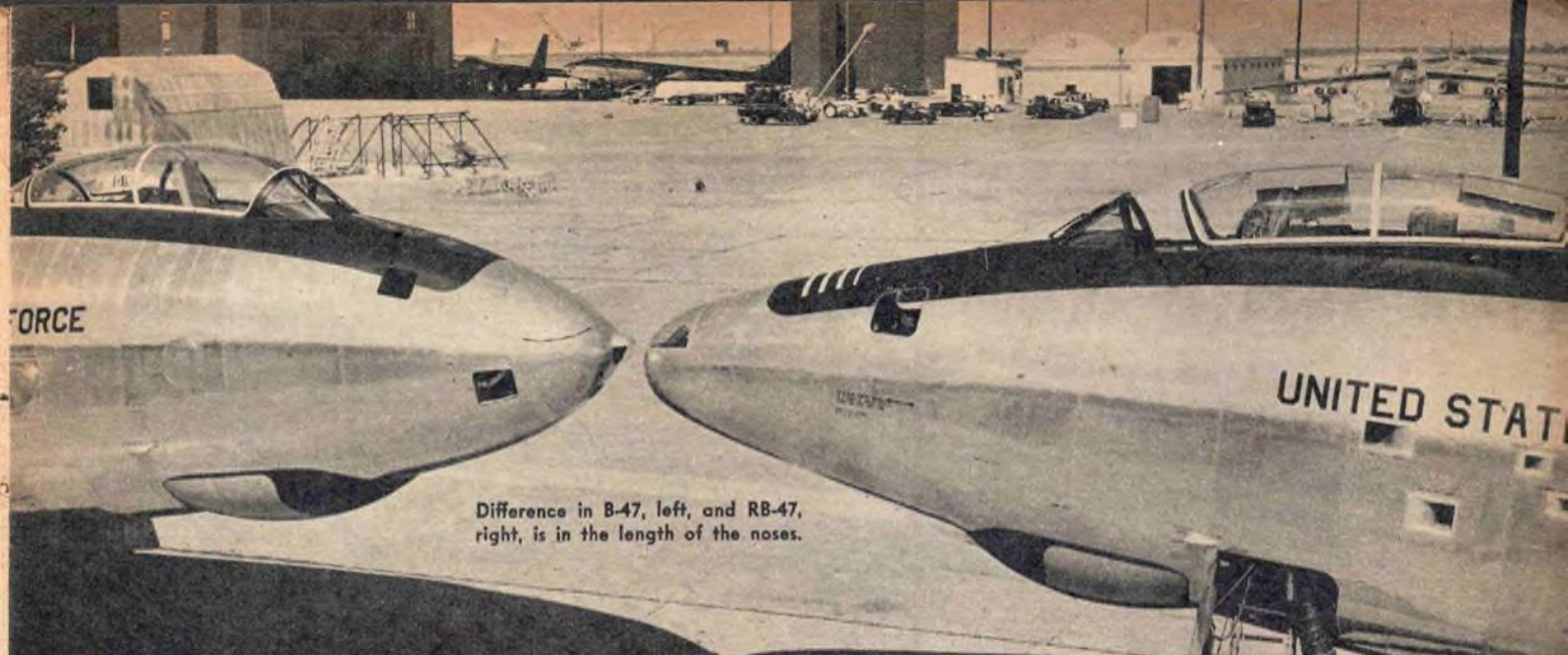
This is all part of the procedure for the naming of aircraft, as monitored by the government. The individual in charge of the use of these proper nouns is Charles Bauer of the Munitions Board Office of Aircraft Programs in the Pentagon, which took over the task from a sub-committee set up to name aircraft during latter part of the war. Mr. Bauer has, in effect, become for the aircraft industry a sort of copyright office and trademarks registry rolled into one, although the office indicates that "it does not assume any of the liabilities which may accrue from conflicting proprietary rights in the name."

The British early had assigned popular names to aircraft and the United States quickly followed suit, realizing that such names are often more easily referred to than series numbers. For instance, the Constellation, built by Lockheed, is seldom referred to by its serial numbers. People just don't like to say: "Look, there goes a 1049!"—even if they would remember those numbers. (This does not mean, of course,



Below: first Japanese military plane for liaison duty, the Kawasaki KAL-1. Powered by 260 hp Lycoming, carries four. Right: Piasecki XH-16 40-pass. military transport 'copter; 2 P&W 1650 hp engines.





Difference in B-47, left, and RB-47, right, is in the length of the noses.

## NAMES come from

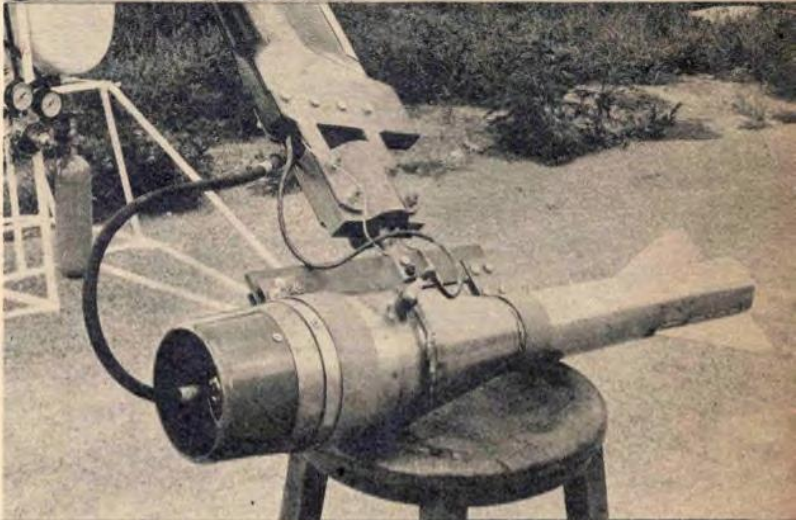
that the name supplants them in any way, for official purposes.)

Among other things, the original sub-committee established basic criteria for naming the various types of aircraft. Fighters were to be given names indicating "speed, maneuverability, fighting characteristics or aggressiveness," thus, the North American F-86 was named "Sabre," and the Republic F-43 was named "Lancer." Bombers were to be given names indicating size, weight, power, range or destructive characteristics, so Convair's B-32 was named "Dominator" and Boeing's B-29, "Superfortress." Patrol types required names employing seafaring terms. Lockheed's PV-2, "Harpoon," and Martin's PBM, "Mariner," fit the bill nicely.

Cargo and personnel transports needed names implying transportation, range, or load-carrying ability. Curtiss' C-76, "Caravan," and Beech's C-43, "Traveller," were accepted by the sub-committee. Trainers were to utilize names employing tuition terms, educational institutions or places of training. Timm's N2T, "Tutor," and Ryan's PT-21, "Recruit," easily conform to the criteria. Reconnaissance planes were to have names indicating keen vision and careful surveillance, and thus Curtiss' O-52 and Consolidated-Vultee's O-59 were named "Owl" and "Vigilant," respectively. There was also a miscellaneous category, (Continued on page 75)



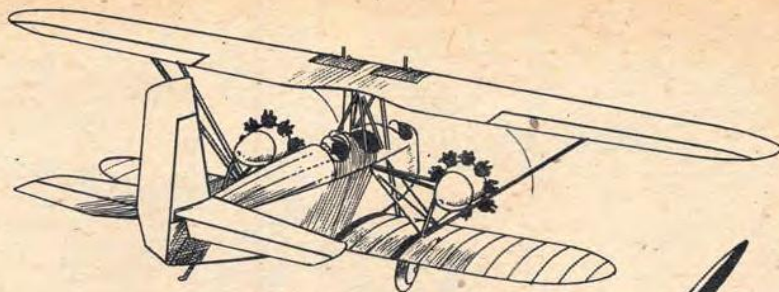
Para-Copter. Pulse-jet helicopter designed by Geo. Schmidt of No. Bellmore, L. I. Engines are of his own design, are swiveled on blades and 80% quieter than standard pulse-jets. Litter under the pilot



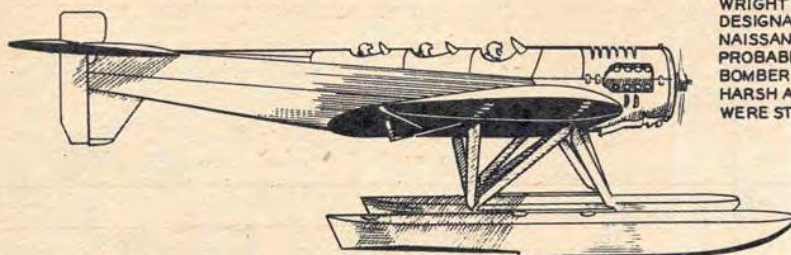


# AIR PROGRESS

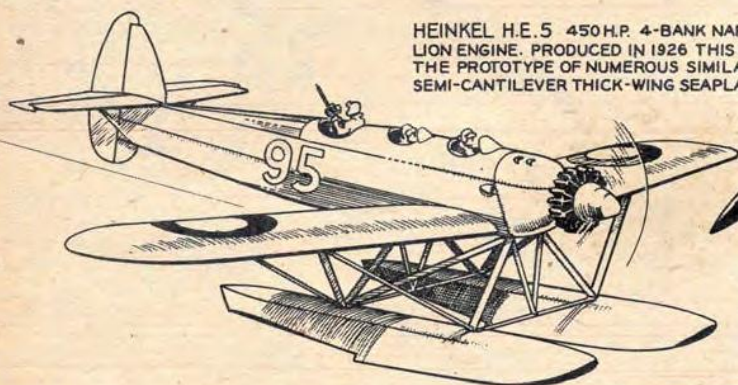
By DOUGLAS ROLFE



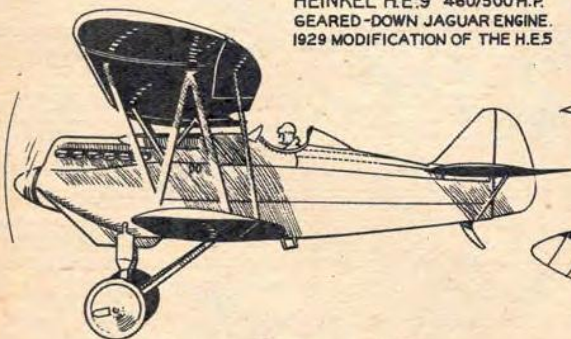
HEINKEL H.D.20 TWO 200 H.P. WRIGHT WHIRLWIND ENGINES. — DESIGNATED AS A PHOTO-RECONNAISSANCE PLANE IT WAS MORE PROBABLY A THINLY DISGUISED BOMBER BUILT IN 1926 WHILE THE HARSH ARMISTICE RESTRICTIONS WERE STILL BEING ENFORCED



HEINKEL H.E.5 450 H.P. 4-BANK NAPIER LION ENGINE. PRODUCED IN 1926 THIS WAS THE PROTOTYPE OF NUMEROUS SIMILAR SEMI-CANTILEVER THICK-WING SEAPLANES



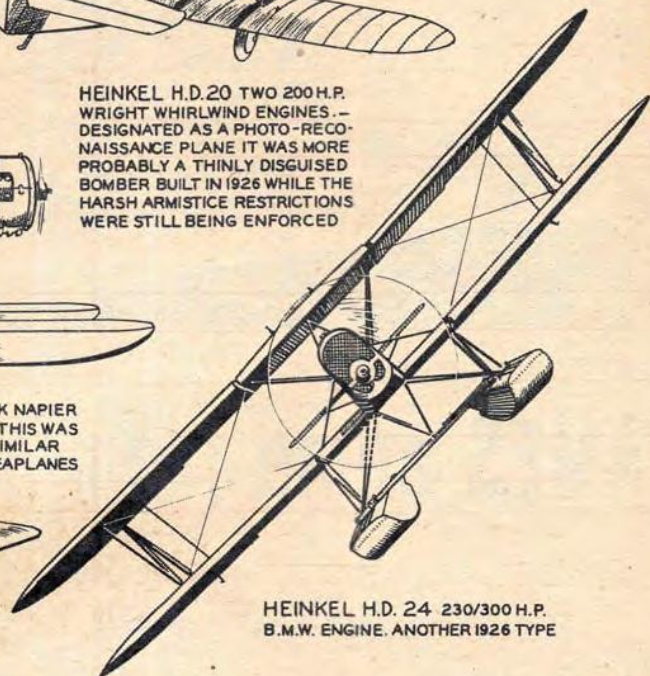
HEINKEL H.E.9 460/500 H.P. GEARED-DOWN JAGUAR ENGINE. 1929 MODIFICATION OF THE H.E.5



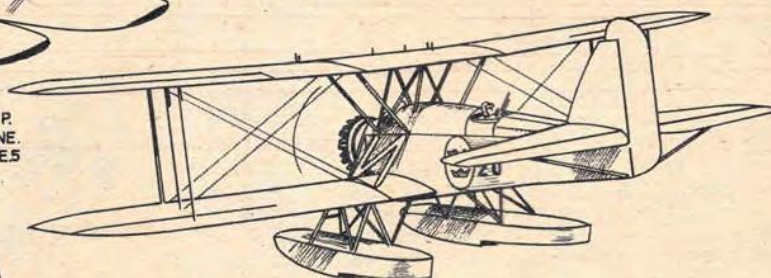
▲ HEINKEL H.D.43 500/700 H.P. B.M.W. ENGINE. APPEARED IN 1929. — WAS FIRST HEINKEL VENTURE IN THE PURSUIT CLASS AND SHOWS STRONG CURTISS INFLUENCE

HEINKEL HE.50 900 H.P. DAIMLER-BENZ ENGINE. FIRST EQUIPMENT OF THE REFORMED RICHTHOFEN GESCHWADER IN THE PRE-WAR LUFTWAFFE. IT WAS ALSO USED IN ACTUAL COMBAT IN SPAIN'S CIVIL WAR

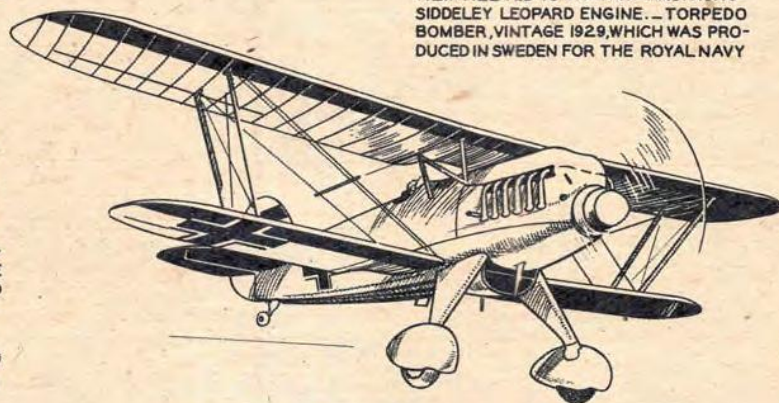
H.D.= HEINKEL DOPPELDECKER (BIPLANE)  
H.E.= HEINKEL EINDECKER (MONOPLANE)



HEINKEL H.D.24 230/300 H.P. B.M.W. ENGINE. ANOTHER 1926 TYPE



HEINKEL H.D.16 675 H.P. ARMSTRONG-SIDDELEY LEOPARD ENGINE. — TORPEDO BOMBER, VINTAGE 1929, WHICH WAS PRODUCED IN SWEDEN FOR THE ROYAL NAVY



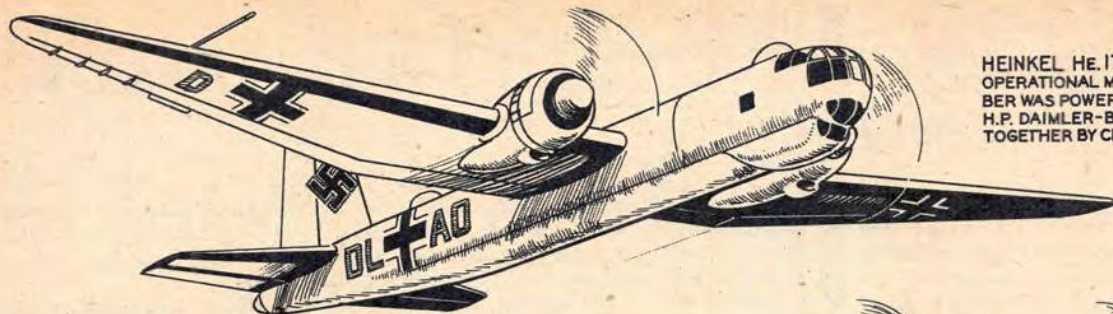
## THE HEINKEL STORY . . .



The Versailles Treaty of World War I forbade the German aircraft industry from building planes that might be of military importance. Ernst Heinkel's firm early produced lightplanes and soon became a leader in circumventing the Treaty with thinly disguised transports and other craft capable of being converted for war use. The advent of

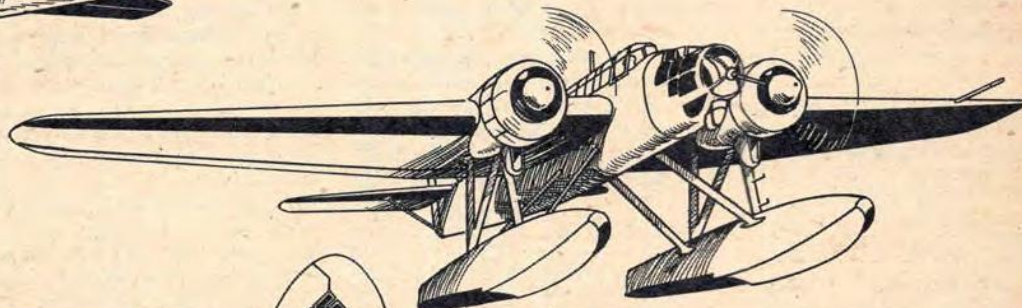
Hitler hastened the process; thus the He.111, presumably a civilian transport, was transformed overnight to serve as an effective bomber in the Spanish war. During the "steamroller" stage of World War II a modified version of the He.111 was the star performer in bombardment, but proved no match for the R.A.F. and went down to defeat in the



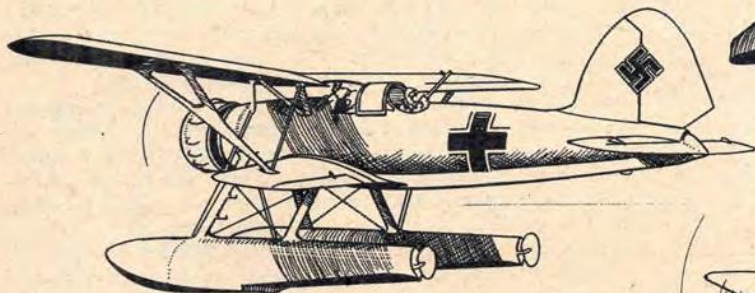


HEINKEL HE.177 ONE OF THE LAST OPERATIONAL MODELS THIS BIG BOMBER WAS POWERED WITH FOUR 1,400-H.P. DAIMLER-BENZ ENGINES COUPLED TOGETHER BY CLUTCH DRIVE IN PAIRS

DOUGLAS  
ROLFE



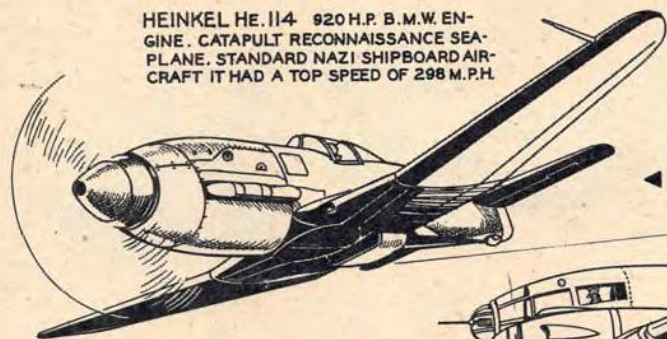
HEINKEL HE.115K2 TWO 920 H.P. B.M.W. ENGINES. RECONNAISSANCE, MINE-LAYING, TORPEDO BOMBER FLOAT-TYPE SEAPLANE



HEINKEL HE.114 920 H.P. B.M.W. ENGINE. CATAPULT RECONNAISSANCE SEAPLANE. STANDARD NAZI SHIPBOARD AIRCRAFT IT HAD A TOP SPEED OF 298 M.P.H.



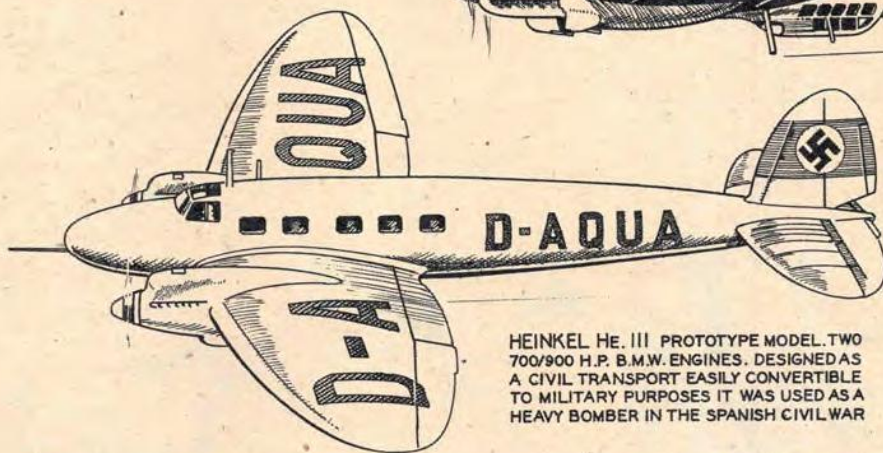
HEINKEL HE.113. 1,150 H.P. DAIMLER-BENZ ENGINE. FAST BUT GENERALLY POOR SINGLE SEAT FIGHTER DEVELOPED FROM THE HE.112U



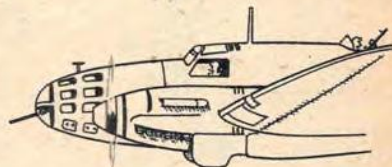
HEINKEL HE.112U RACING VERSION OF THE STANDARD HE.112 FIGHTER. SET NEW WORLD RECORD (463.5 M.P.H.) IN 1939, TOPPED BY THE MESSERSCHMITT B.F.113 LATER IN SAME YEAR



HEINKEL HE.111K5A, VARIOUSLY POWERED AND ARMED IT SERVED DURING THE HITLER WAR AS A BOMBER, GLIDER TUG, TROOP CARRIER AND FINALLY AS A GUIDED BOMB. A CURIOUS MODIFICATION, THE HE.111Z, CONSISTED OF TWO HE.111 MODELS JOINED TOGETHER AT MID-WING PLUS A 5TH ENGINE



HEINKEL HE.111 PROTOTYPE MODEL. TWO 700/900 H.P. B.M.W. ENGINES. DESIGNED AS A CIVIL TRANSPORT EASILY CONVERTIBLE TO MILITARY PURPOSES IT WAS USED AS A HEAVY BOMBER IN THE SPANISH CIVIL WAR



HE.111 ORIGINAL BOMBER CONVERSION INCLUDED LONGER NOSE, -2 GUN STATIONS

Battle of Britain. Later Heinkel types were better armed and the elliptical wing was discarded in favor of more speedy production.

The greatest Heinkel accomplishment, however, was in the field of jet propulsion. The He.178 (shown on left), the world's first jet airplane, took to the air in August 1939. Even its turbojet

powerplant was of Heinkel design—the He.3, developing around 1,000 lbs. thrust. The He.178 was purely experimental, never saw active service. Heinkel's last effort before the end of WW II was the He.162 fighter (photo on right), powered by a BMW 003-E engine of 1800 lbs. thrust, with top speed of 522 mph at 20,000 ft.





FEBRUARY 1954/35 CENTS

# Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING



**AAF vs the Jet Stream:  
THE DAY WE  
MISPLACED ITALY**

**Easy-to-make  
R/C model boat:  
SEA SCOOTER**

**Pin-up pictures of  
America's newest  
fighter: F-100**

**Modeled by Musciano:  
MITSUBISHI ZERO**

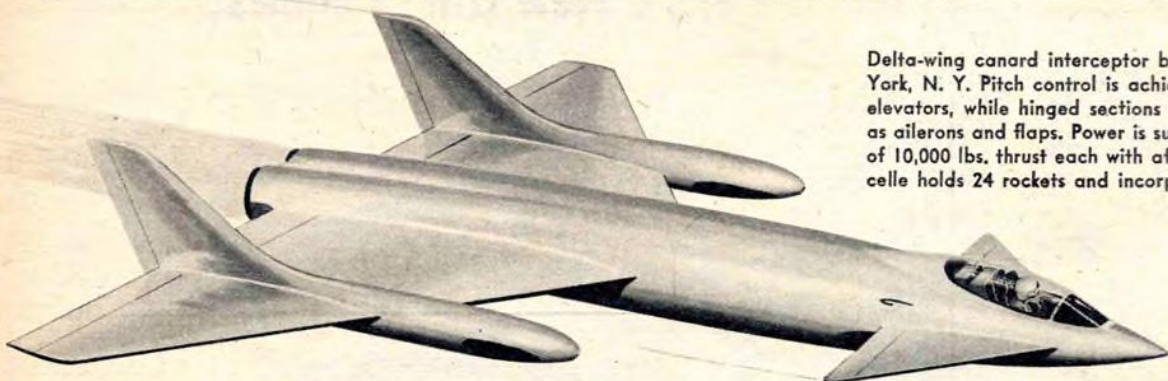
CAL SMITH



# 1ST AWARD Canard Fighter-Interceptor



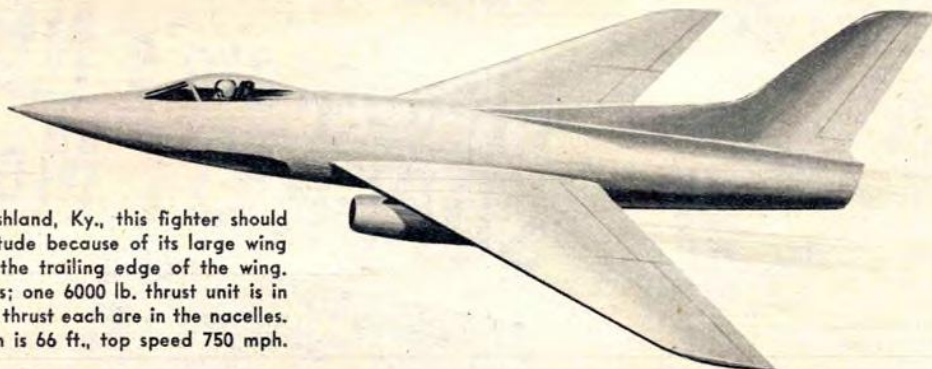
Delta-wing canard interceptor by Franchot Smith of New York, N. Y. Pitch control is achieved by forward-mounted elevators, while hinged sections in wing trailing edge act as ailerons and flaps. Power is supplied by two jet engines of 10,000 lbs. thrust each with afterburners. Each wing nacelle holds 24 rockets and incorporates interceptor radar.



# 2ND AWARD High-Altitude Jet Fighter



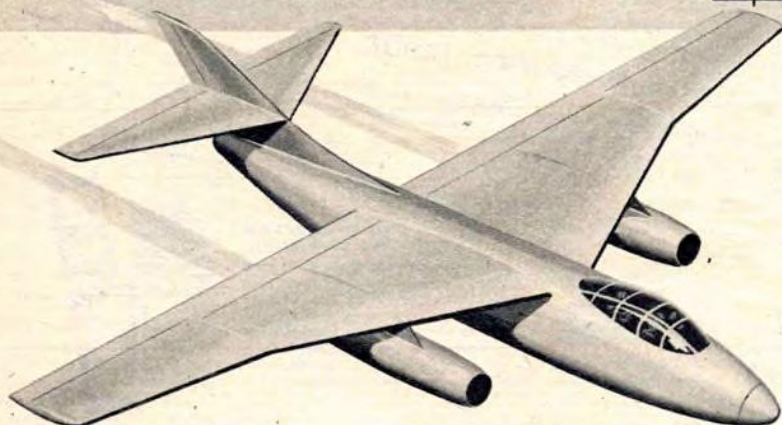
Submitted by Jimmy Edwards of Ashland, Ky., this fighter should show good performance at high altitude because of its large wing area. Elevators are incorporated in the trailing edge of the wing. Plane is powered by three jet engines; one 6000 lb. thrust unit is in the fuselage and two jets of 1000 lbs. thrust each are in the nacelles. Armament: four 20-mm cannon. Span is 66 ft., top speed 750 mph.



# 3RD AWARD Crescent Wing Atomic Bomber



Twin-jet bomber capable of carrying atomic bombs by Leo Navor of San Bernardino, Calif. The wing shape follows the crescent type with 36° sweepback of the main wing and 12° at tips. Plane has bicycle type landing gear which retracts into the fuselage with two outrigger wheels at wingtips. Engines develop 10,000 lbs. of thrust each. The armament consists of four 30-mm cannon in nose, and atom bomb in bomb bay. Pressurized cockpit, crew of 2, 760 mph.



## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8 1/2 x 11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



# Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

Cover: North American F-100 Super Sabre, AF's latest fighter. First service craft capable of sonic speed in level flight. Now just going into production, the F-100 should be a decisive instrument in maintaining peace.



FEB. 1954 • Vol. 41, No. 5

## FOR THE READER

|                                     |    |
|-------------------------------------|----|
| DOPE CAN                            | 8  |
| WESTERN ROUNDUP—DICK EVERETT        | 12 |
| AIRMEN OF VISION                    | 14 |
| SOUTHERN SCENE—R. H. ELLIOTT        | 16 |
| X-3                                 | 19 |
| F-100                               | 20 |
| AIR PROGRESS: AMERICAN HELICOPTER   | 22 |
| REVUE, PART 1—DOUGLAS ROLFE         |    |
| THE DAY WE MISPLACED ITALY          | 24 |
| —PAUL JENSEN                        |    |
| PAPPY PIPER'S NEW APACHE            | 26 |
| MACCHI M. B. 323 ADVANCED TRAINER   | 27 |
| MITSUBISHI ZERO—W. A. MUSCIANO      | 28 |
| COLD WEATHER FLYING                 | 30 |
| —JOHN BERRYMAN                      |    |
| HONEYBUG—FRANK EHRLING              | 32 |
| TEAM RACING . . . FOR FUN OR SPORT  | 32 |
| WE'D LIKE YOU TO MEET               | 35 |
| BLUEBOY—HAL ROTH                    | 36 |
| WEIGHT LIFTING AT WILLOW GROVE      | 38 |
| SEA SCOOTER—AUBREY KOCHMAN          | 40 |
| MONOGRAM'S MITCHELL BOMBER          | 44 |
| AMERICAN TELASCO'S JETEX RACE CAR   | 44 |
| KENHI'S BOBCAT STUNTER              | 45 |
| SCIENTIFIC'S AT-6 TEXAN             | 45 |
| NANCY—RODOLFO G. CARLSTEIN          | 46 |
| MOTOR OF THE MONTH: "OK" CUB DIESEL | 50 |
| MINI-MAC HARD TUBER—HOWARD McENTEE  | 52 |
| R/C AT THE NATIONALS                | 54 |
| SUPER AEROTROL                      | 56 |
| R/C NEWS AND COMMENT                | 57 |
| —HOWARD McENTEE                     |    |
| SKETCHBOOK—DRAWINGS BY THOMAS       | 66 |
| SAILPLANE PARADE                    | 72 |
| SHOWCASE                            | 76 |
| AIR NOTES                           | 79 |

## STREET & SMITH PUBLICATIONS, INC.

President . . . . . Gerald H. Smith  
Executive Vice President . . . . . Ralph R. Whittaker, Jr.  
Vice President and Secretary . . . . . Arthur P. Lawler  
Treasurer . . . . . Thomas H. Kaiser  
Advertising Director . . . . . Robert E. Park

AIR TRAILS published monthly by Street & Smith Publications, Inc., at 575 Madison Ave., New York 22, N. Y. Entered as second class matter at the post office at New York, N. Y. Authorized as second class mail Post Office Dept., Ottawa, Canada. Copyright 1954 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. 35¢ per copy. This issue is Vol. XLII, No. 5. Please advise us if you move; allow four weeks for change of address. Give old and new address when notifying us. Subscription correspondence should be addressed to Subscription Dept., Street & Smith Publications, Inc., 304 E. 45th St., New York 17, N. Y. All characters used in fiction and semi-fiction stories in this magazine are fictitious. We cannot accept responsibility for unsolicited manuscripts or art work. All submissions must include return postage. Printed in U.S.A.

## AIR TRAILS

Editor . . . . . Albert L. Lewis, AMA No. 2  
Assistant to the Editor . . . . . Rose Borello  
Technical Editor . . . . . Alexis Dawydoff, FAI No. 321  
Editorial Production . . . . . Carl Happel  
Art Director . . . . . W. F. Tyler  
Editorial Assistant . . . . . Barbara Grey

### Correspondents:

Radio Control Models . . . . . Howard G. McEntee, W251  
West Coast . . . . . Dick Everett, AMA No. 324  
South . . . . . R. H. Elliott

Walter J. McBride, Advertising Manager  
575 Madison Ave., New York 22, N. Y.  
Frank C. Smith, Mid-Western Advt. Mgr.  
230 N. Michigan Ave., Chicago 1, Ill.  
West Coast Advertising Representative:  
Kimball, Menne Co., Inc.  
2550 Beverly Blvd., Los Angeles 4, Calif.  
681 Market St., San Francisco 5, Calif.

## FROM THE READER

**R/C Booklet.** . . I have always been a free flight man and was never very interested in the other aspects of modeling. However, there comes a time in every man's life, or so it goes, and I have had mine. Mainly I want to get going in radio control.

Can you give me any help or advice on radio control? What I mainly am interested in is what kind of ship shall I build? What kind of power for the motor? What transmitter? What receiver? What escapement? What channel? Believe me, I'm lost!

Is there any way that I can purchase complete parts for the Little Locator (described in last August issue) in kit form or otherwise?

Cpl. George S. Prochaska, U. S. Army

● A compilation of outstanding articles on radio control specially selected for the novice and reprinted from Air Trails is available from Hobby Helpers, 770 Hunts Point Ave., New York 59, N. Y. The booklet is called "Basics of Radio Control for the Model Builder" and sells for 35¢. For information on parts for McEntee's Little Locator write Dover Electronics Co., 201 E. Blackwell St., Dover, N. J.

**Captain Smith Reports.** . . In your excellent 1953/1954 issue of Air Progress I note that you have given impetus to that ancient canard about the Thomas Morse Scout being a fighter. ("Fighters Then and Now!") The Scout was built in my home town of Ithaca, New York, and this fact was influential in starting me out on a 20-year career in commercial aviation which led to a position as Captain on American Airlines.

I therefore owe much to the Scout, and hate to see it misrepresented. The Scout was not designed as a fighter, nor was it ever used as a fighter. It was designed as a training aircraft, it was so used, and no Thomas Morse Scout ever went overseas.

Everyone from the New York Times on down has, from time to time, referred to the Scout as a fighter. To old-timers who knew and loved the ship, this is a gross inaccuracy which they would like to see—once and for all—laid to rest.

Charles L. Smith, Ithaca, N. Y.

**Model Aircraft Directory.** . . We would greatly appreciate information or assistance in securing a list of model airplane company addresses in the United States.

We intend to have our cadets make various type models and wish to secure as complete a source list as possible.

Col. Austin L. Berry,  
Professor of Air Science and Tactics,  
AFROTC, Brooklyn College

● Most of the modelplane concerns in this country appear in the advertising columns of Air Trails. An alphabetical listing, complete with addresses and products, will be found in Air Trails Model Annual for 1954, on sale early in February.

**Jap "Randy" and the Dirty Look . . .** Have just read your 53/54 issue of Air Progress, and want to congratulate you on your efforts to complete the gaps of both U. S. and Jap military aircraft heretofore unreleased. The one aircraft that has always interested me the most was the one on page 46 in this edition of Air Progress, the P-66 Vulture Vanguard.

I myself have seen both the air and liquid cooled engine models. I never could understand why this plane was released to foreign countries. You mentioned some were shipped to Sweden. A number of these were also shipped to England and subsequently they in turn shipped them to Nationalist China; hence, the Japanese derived their famous "Zero" fighters.

I spotted a Jap twin-engine fighter similar to your designated "Randy" KI-83, as early as Sept. 1942 in the South Pacific. I thought it was an Me. 110 released to Japan from Germany. I reported it as an Me-110, at which I received a dirty look. You have convinced me I wasn't too far wrong in what I saw, as it does resemble somewhat the Me-110.

Don't you agree?

Gilbert V. Wolloff, Somersworth, N. H.

**Supersonic Job . . .** In your issue of Air Trails of November 1952 the aircraft in the story "Interceptors Beyond Sound" was very interesting to me so I thought I would make a plan and a model with a few changes such



as an air intake behind the canopy. I am enclosing photos of the model.

Fred Young, Linden, N. J.

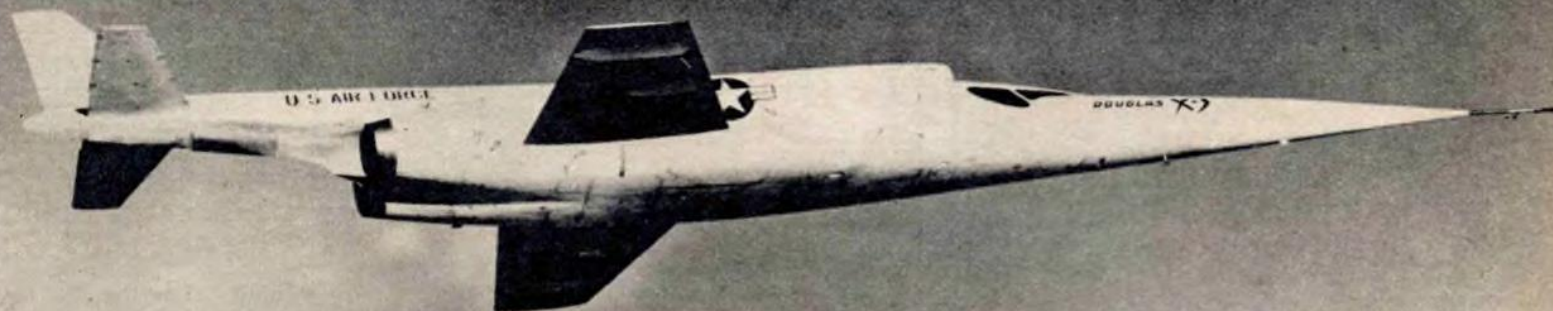
**Endurance Model.** . . A few months ago an Associated Press dispatch appearing in papers throughout the country electrified all aeromodeldom with the news that 14-year-old Sherman Holt of Fayetteville, N. C., had set a new world endurance record for model planes of 8 hours, 31 minutes and 50 seconds with a controller. Refueling through a plastic tube running up one of the lines, he considerably bettered the former record of 1 hour and 35 minutes. And as estimated in subsequent reporting of the event by Time magazine, "if the model had (Continued on page 9)"

All communications to the editors should be addressed to 304 East 45th St., New York 17, N. Y. Subscription prices: U. S. and Possessions—\$3.50 per year, \$6.00 for two years; Canada—\$4.00 per year, \$7.00 for two years; countries of the Pan American Union—\$7.00 per year, \$10.00 for two years; elsewhere—\$10.00 per year, \$14.00 for two years. Please advise us if you move, giving old address and new address; allow four weeks for change of address; address all subscription mail to Air Trails Subscription Department, 304 East 45th St., New York 17, N. Y.



# X-3

Its diminutive wings and brute power were designed to carry this airplane at Mach 3 speed. It's not a docile craft —those who fly it call it "The Beast"



A weird shape has been appearing high above the Air Force testing grounds at Muroc resembling a spike with tiny wings. This is Douglas Aircraft Company's latest high-speed research plane, designed and built to fly better than 2000 mph at extreme altitude where the cold will keep down the blistering heat caused by its own motion through the air. The X-3, with the exception of its 22 ft. 8 in. wing, is not a small airplane. The fuselage, measuring 66 ft. 9 in., is longer than that of the DC-3 and its gross weight of 27,000 lbs. exceeds the DC-3 by 2000 lbs. Unlike its predecessor the Skyrocket, the X-3 takes off from the ground, requiring a run of close to 3 miles. It is powered by two Westinghouse J-34s with afterburners, which give it a total thrust of around 10,000 lbs.





# F-100





To North American Aviation, Inc., in Los Angeles go the honors of producing the one hundredth type of Air Force fighter. What is most significant, this F-100 Super Sabre is also the first fighter capable of flying at sonic speed in level flight. Based in essentials on the F-86 Sabre, the F-100 is a much larger and heavier airplane with greater angle of sweepback in its thin, razor-edge wing, better streamlined fuselage, and cockpit canopy. Contrary to practice in high-speed airplanes, the horizontal tail is set low, its surface is all-movable, not divided as on conventional airplane into elevator and stabilizer. This gives the F-100 superior stability characteristics in the critical transonic range. The Super Sabre is powered by a Pratt & Whitney J-57 jet engine with an afterburner which gives it well over 10,000 lbs. of thrust. Naturally, such a fast, heavy airplane has a fairly high landing speed; in order to shorten its roll on the ground it is equipped with a drag chute. On October 29, 1953, the F-100 established a new world speed record for the 15 km (9 miles) course at Salton Sea, Calif., averaging 754.9 mph, with the fastest run clocked at 767.27 mph.



## PERFORMANCE AND SPECIFICATION DATA ON F-100 SUPER SABRE

### Dimensions

Span: 36'  
Length over-all: 45'  
Height over-all: 14'

### Wings

Swept back 45 degrees  
Spar—aluminum alloy  
Ribs—aluminum alloy  
Covering—alum. alloy tapered

### Landing Gear

Type: tricycle retractable

### First Flight Date

YF-100—May 25, 1953

### Mission

Air superiority fighter designed for max. climb, maneuverability, altitude, and high speed

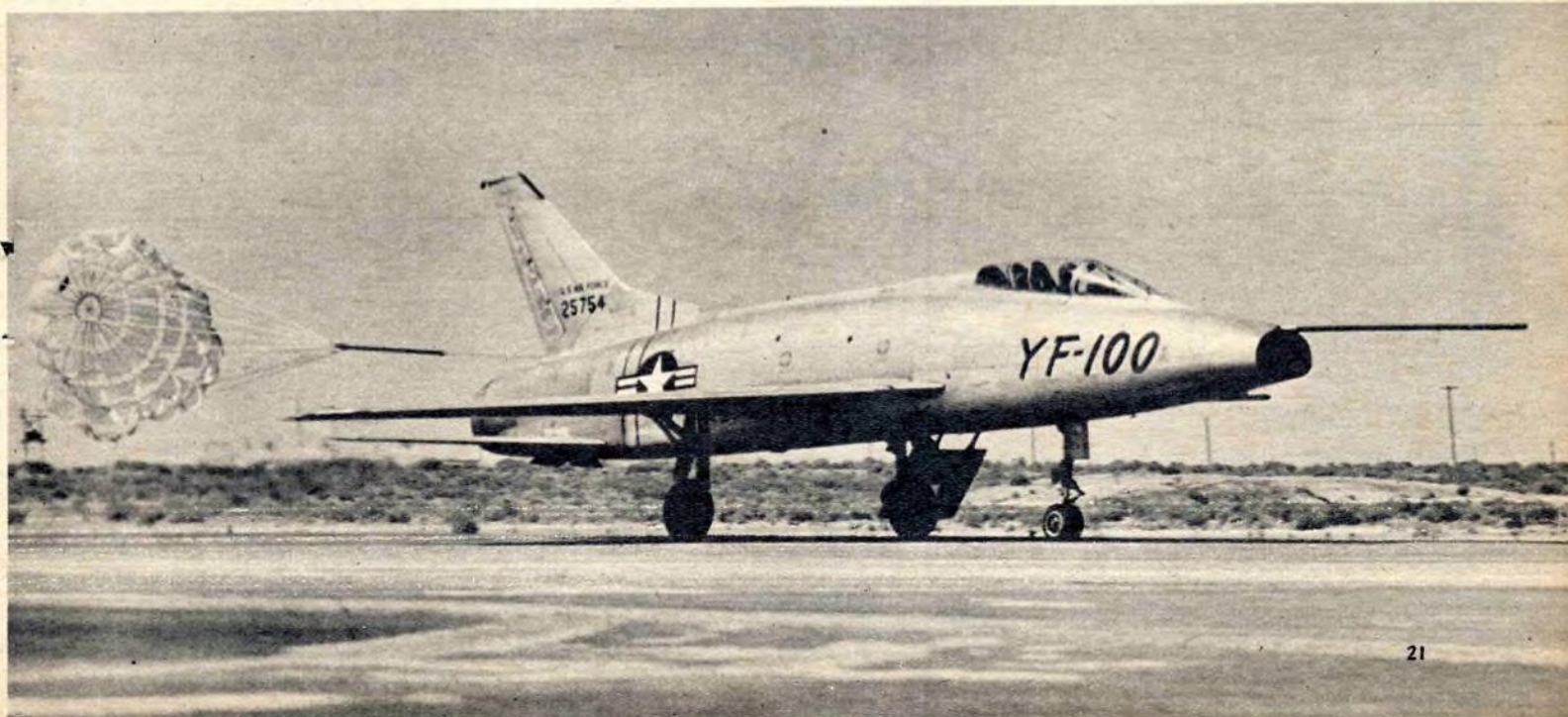
### Powerplant

Make of engine: P&W J57-P7

### Performance

Speed: supersonic  
Combat radius: 500+ naut. mi.  
Maximum service ceiling: over 50,000 ft.

Crew: Pilot





# AIR PROGRESS

By DOUGLAS ROLFE

In 15 years the helicopter has advanced from a lumbering birdcage contraption to an air vehicle of great versatility

## American Helicopter Revue

### PART I—SIKORSKY VS-300

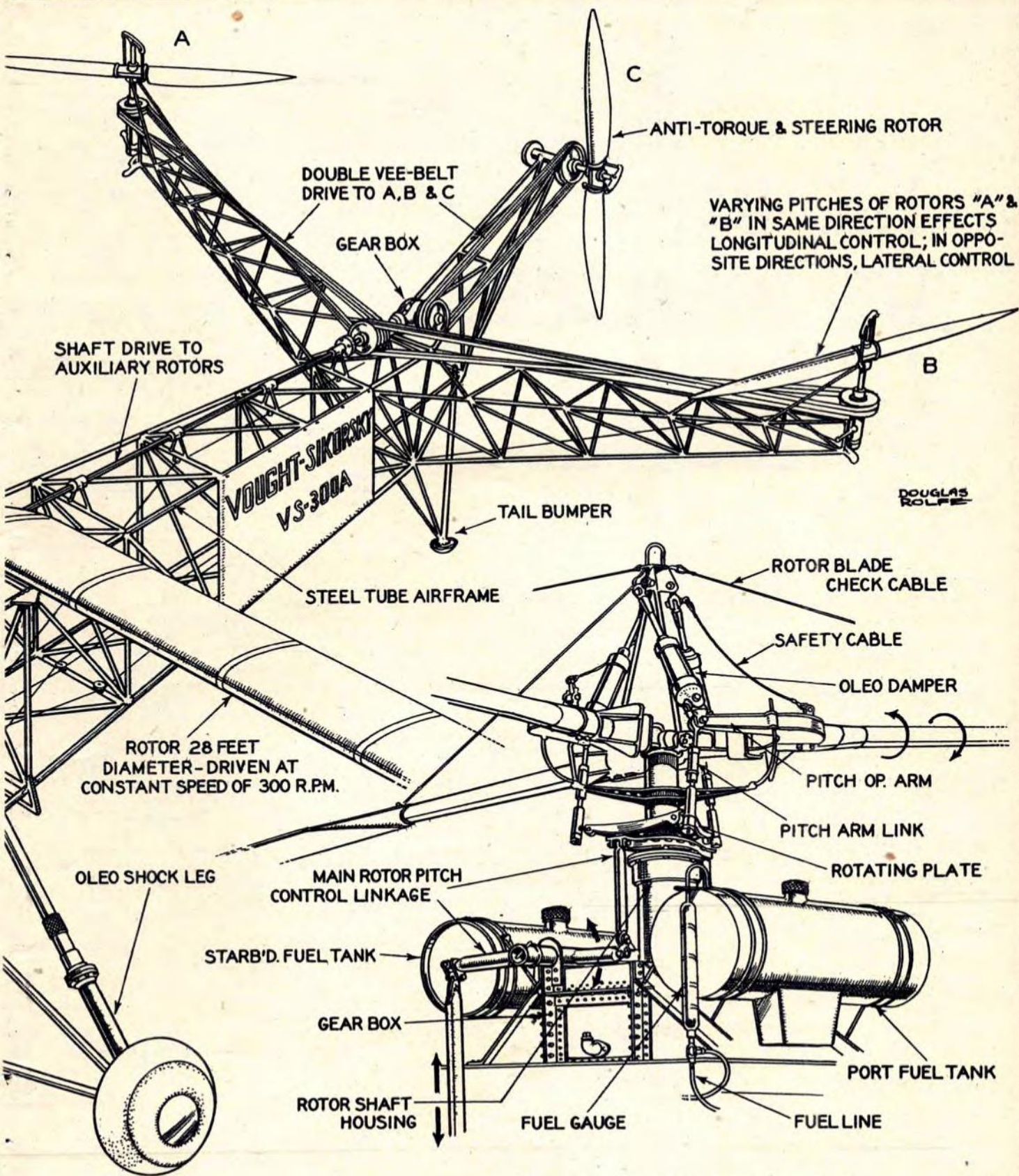


The VS-300 made its first successful flight in 1939. The first airplane flew in 1903. But the development of the airplane in the fifteen years following the Wright brothers' great achievement does not compare with that of the helicopter in an equal period. A new form of powered flight was put into practical form with Sikorsky's craft that was also in the

epoch-making league. Like the Wright biplane it was a crude open-frame machine. Like the Wright it had a cumbersome method of control when viewed from present-day standards and, also like the Wright, it took a lot of flying.

As will be seen from the detailed drawing the first Sikorsky (there were several modifications of the design) had





DETAIL OF MAIN ROTOR HEAD

one main rotor driven through belt and gear drive. This rotor provided the main lift and the pitch of the blades could be changed collectively only. Longitudinal and lateral control were provided by the two small laterally displaced tail rotors. Directional steering was effected through the anti-torque tail rotor. It was all very complicated but it worked.

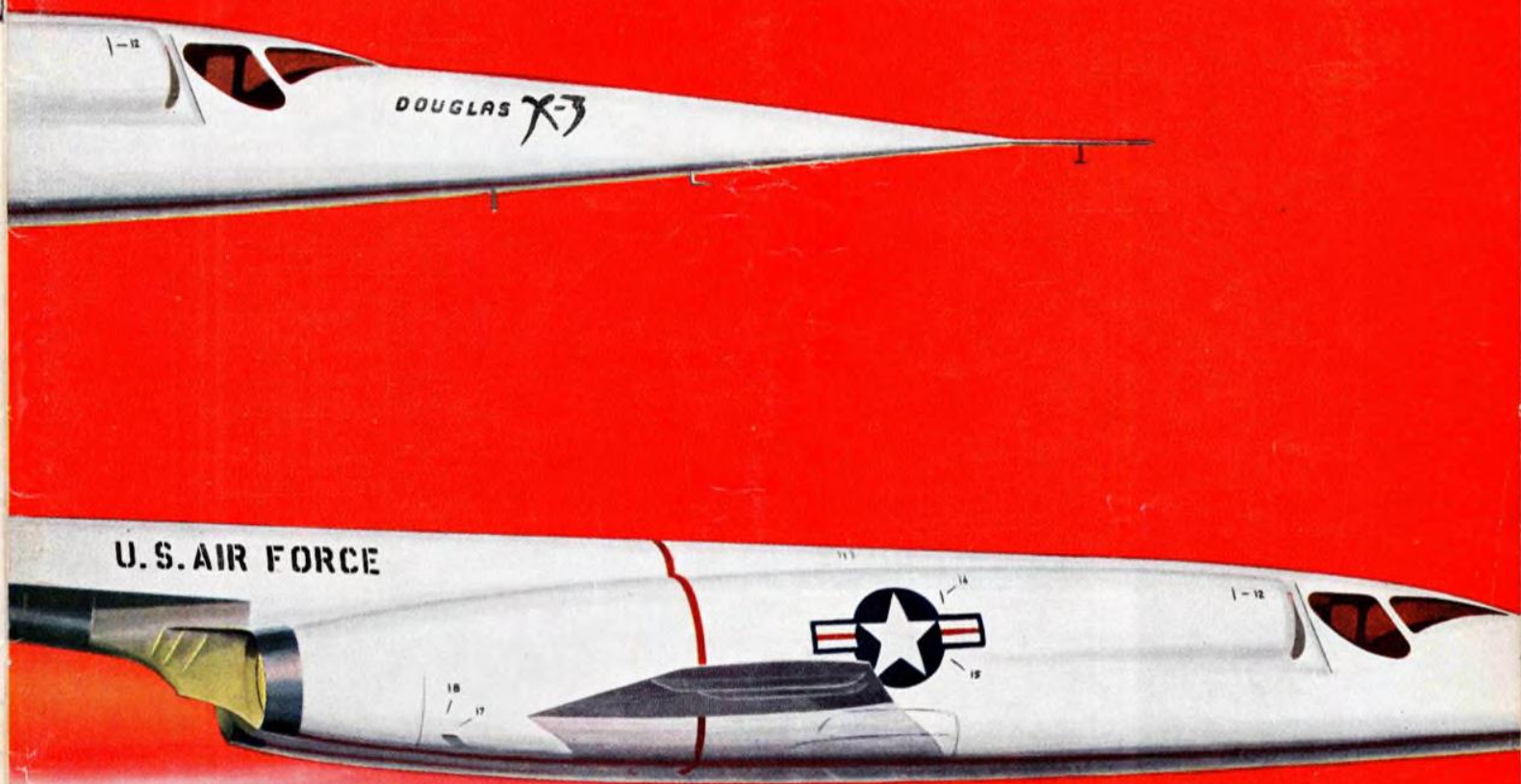
Forward flight was accomplished by tilting the machine down by means of the small lateral rotor which could also tilt the machine laterally for sideways flight. With the development of the cyclic pitch gear the laterally displaced rotors became redundant. However, Sikorsky's first practical helicopter had shown the way.



# Air Trails

THE LEADING MAGAZINE OF AIR PROGRESS AND AEROMODELING

MARCH 1954 / 35 CENTS



**Authentic Three Views:**

Boeing's Famous P-26A

**Frank Lashek's Flying Scale:**

Martin P4M-1 Mercator

**Rolfe's Air Progress Sketches:**

Historic U. S. Helicoptors

**National Championship Model:**

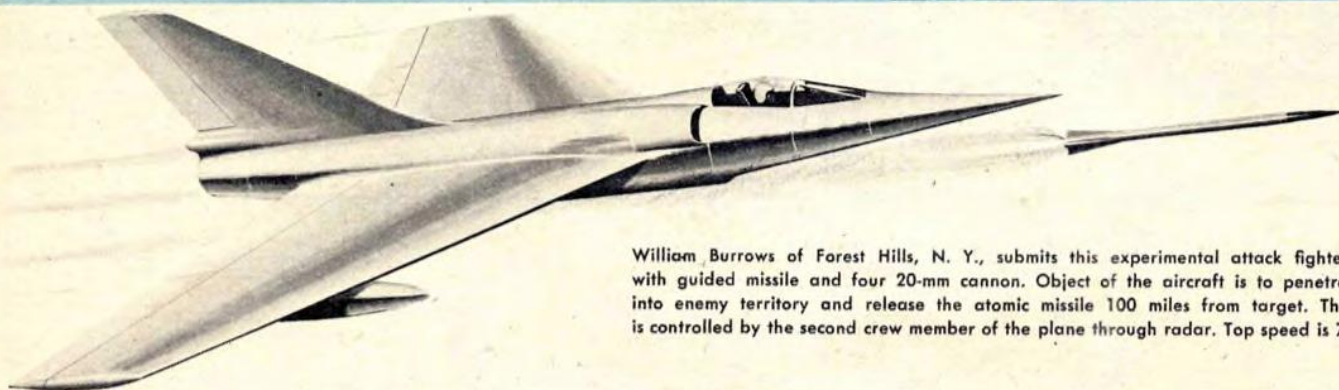
Port's "High-Q" R/C Winner



CAL SMITH



## 1<sup>ST</sup> AWARD Experimental Attack Fighter

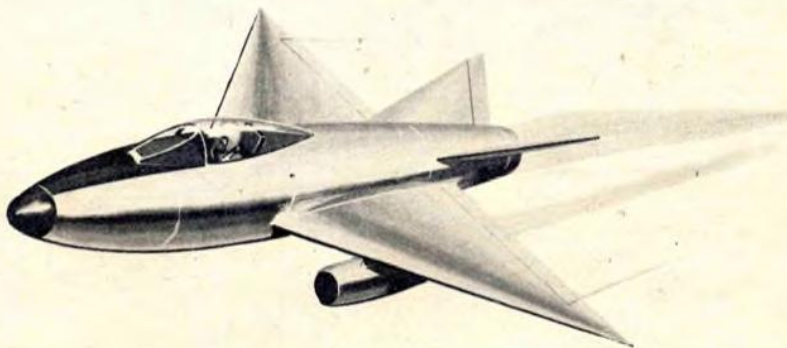


William Burrows of Forest Hills, N. Y., submits this experimental attack fighter armed with guided missile and four 20-mm cannon. Object of the aircraft is to penetrate deep into enemy territory and release the atomic missile 100 miles from target. The missile is controlled by the second crew member of the plane through radar. Top speed is 725 mph.

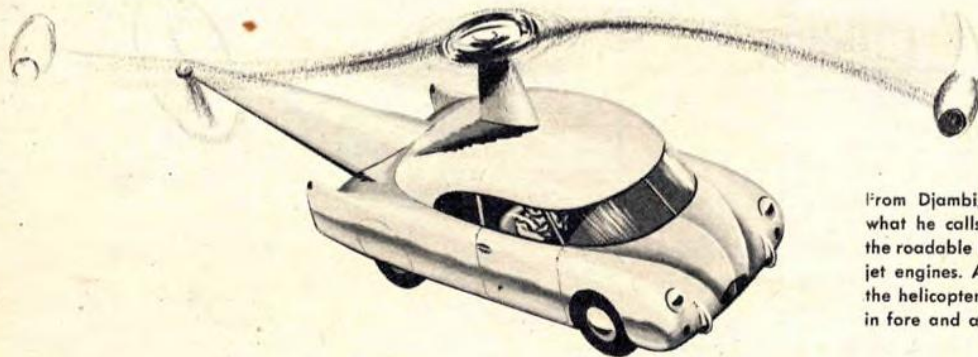
## 2<sup>ND</sup> AWARD Ramjet Powered Interceptor



A Vee-tailed delta design by Bob Deadmond of Odin, Ill. The plane is powered by two ramjet engines on wingtips and a rocket motor in the fuselage. The rocket is used to bring the plane up to speed where the ramjets become effective. The Vee-tail creates less drag than the conventional one and makes ejection in event of emergency less dangerous as the ejected seat can clear the surfaces more easily than if the plane had a high vertical fin. Armament is four 20-mm cannon, span 28 ft. Top speed 800 mph, ceiling 60,000 ft.



## 3<sup>RD</sup> AWARD Roadable Jet Helicopter



From Djambi, Indonesia, R. Gorter sends in the design for what he calls the All-American Aero-Car. The rotor vanes of the roadable helicopter are powered by two 260 lb. thrust pulse jet engines. A gas turbine powers the ground vehicle part of the helicopter. When operating as a car the blades are placed in fore and aft position. Gross weight of machine is 5000 lbs.

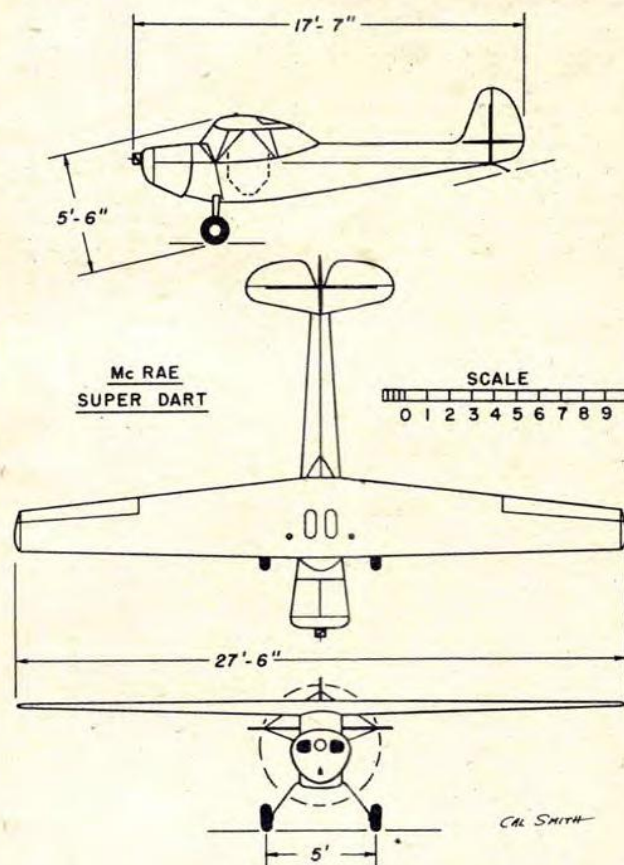
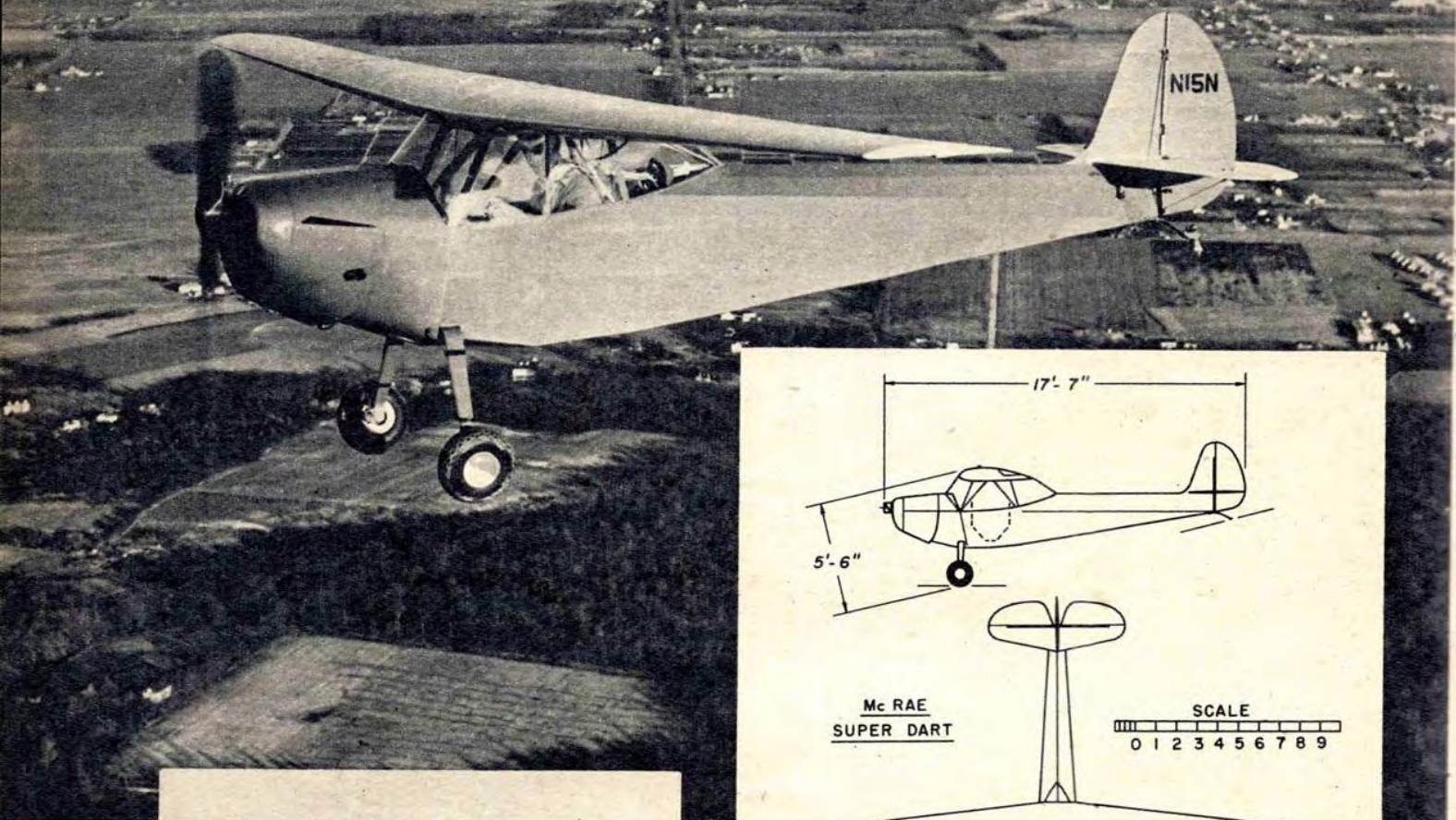
## AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type:

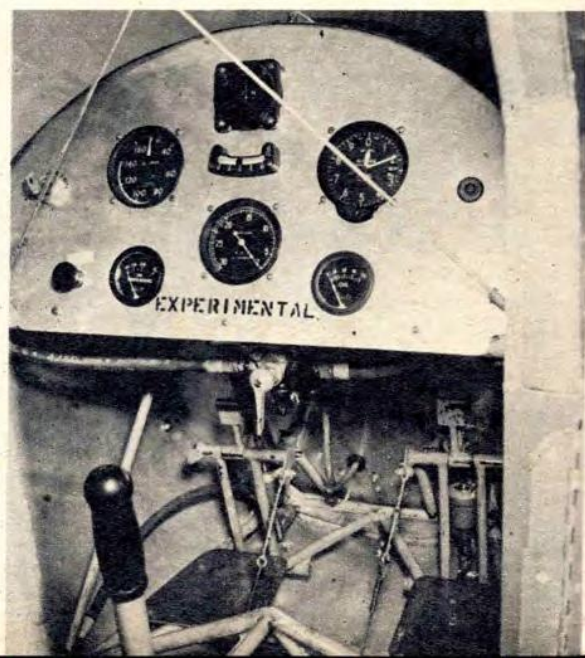
commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of \$25. Payment of \$5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.



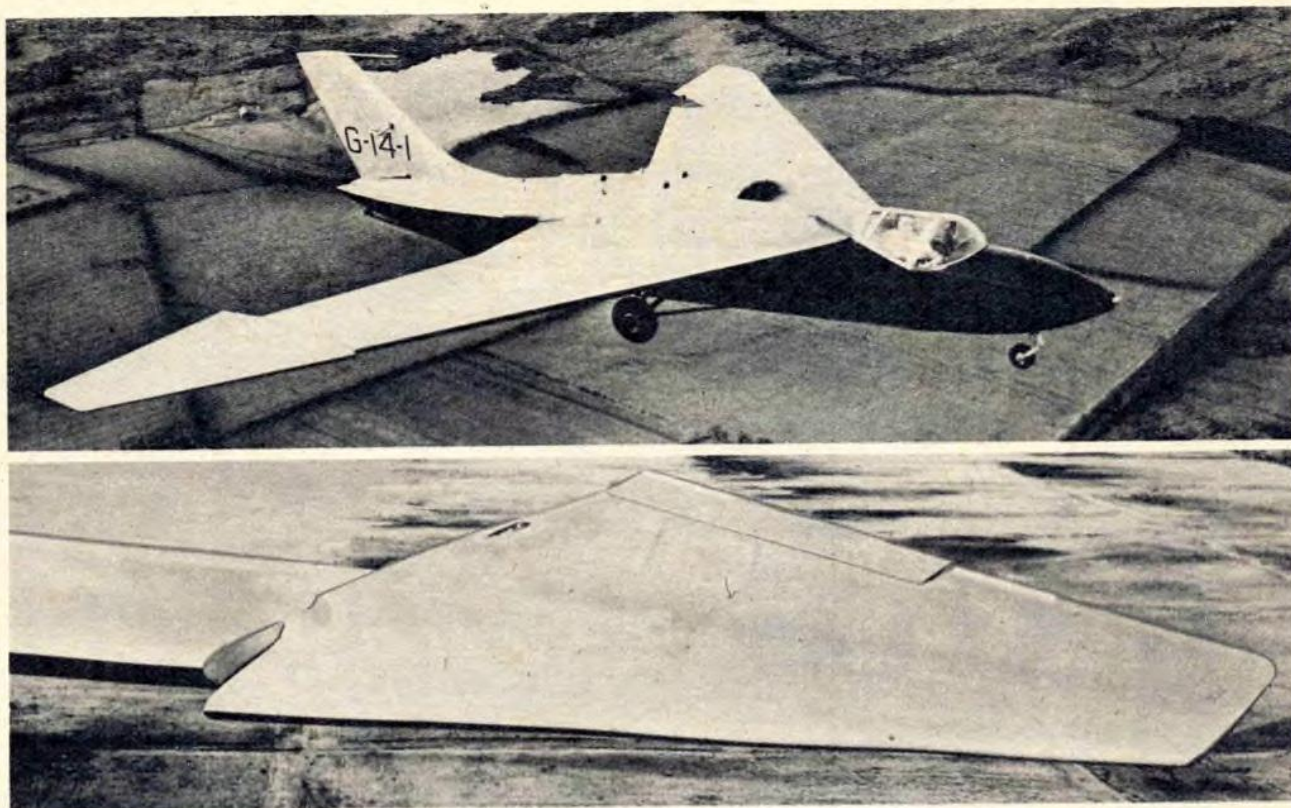
# WORLD-A-WING



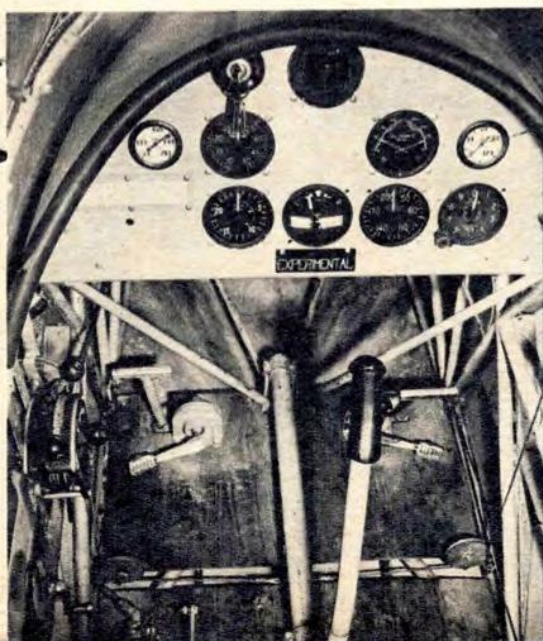
McRae Super Dart, one of the neatest home-built airplanes, is the work of Jack McRae, a stress analyst with Grumman Aircraft Engineering Corp. Basic shape and some of the structure are those of a 20-year-old Driggs Dart. Fuselage is of metal tubing, fabric covered; the high aspect ratio cantilever wing is all-wood, with plywood skin and solid balsa ailerons. The landing gear was especially made for McRae by Cessna. The single-place Super Dart is powered by a 55 hp Lycoming engine turning a Flottorp propeller. Wing area of the airplane is 76 sq. ft., gross weight 750 lbs., giving it a wing loading of slightly under 10 lbs. per sq. ft. Clean design and efficient wing are responsible for its high top speed of 125 mph, landing speed 50 mph. Fuel is carried in two 5-gallon tanks. Range is 300 miles. The cockpit of the Super Dart (see photo on the right) is simple compared to many a present-day aircraft, but contains all necessary flight and engine instruments. It took McRae five years to finish the little home-built, but the results were highly satisfactory. The plane, kept at the Deer Park Airport on Long Island, is used by him for pleasure flying along with his Cessna 140.







Above: British Short Sherpa, aero-isoclinic wing experimental airplane in flight. Photo directly below shows the rotating wingtips which serve both as elevators and ailerons. This revolutionary control maintains constant angle of wing incidence regardless of flexing and greatly improves maneuverability of high-speed aircraft at high altitudes. Right: Brantly B-2 light all-metal two-place helicopter, a new-comer in rotary wing craft field. Rotor blades have two flapping hinges each; 135 hp Lycoming engine features induction cooling instead of fan. Seats two side-by-side. Below: Another home-built, also from Deer Park Airport, L. I., the Nelson N-4. This one owes its existence to the Piper Cub from which it was constructed by owner-builder Ray Nelson who made it as his practical exam for the CAA Aircraft & Engine mechanic's license. Powered by an 85 hp Continental engine with twin stacks from Temco Swift. Wheels are from Ercoupe. Wingspan is 24 ft. 9 in., length 23 ft. 6 in. Gross wt. 1200 lbs. 118 mph tops. Instruments include bank & turn indicator, cylinder temperature gauge.



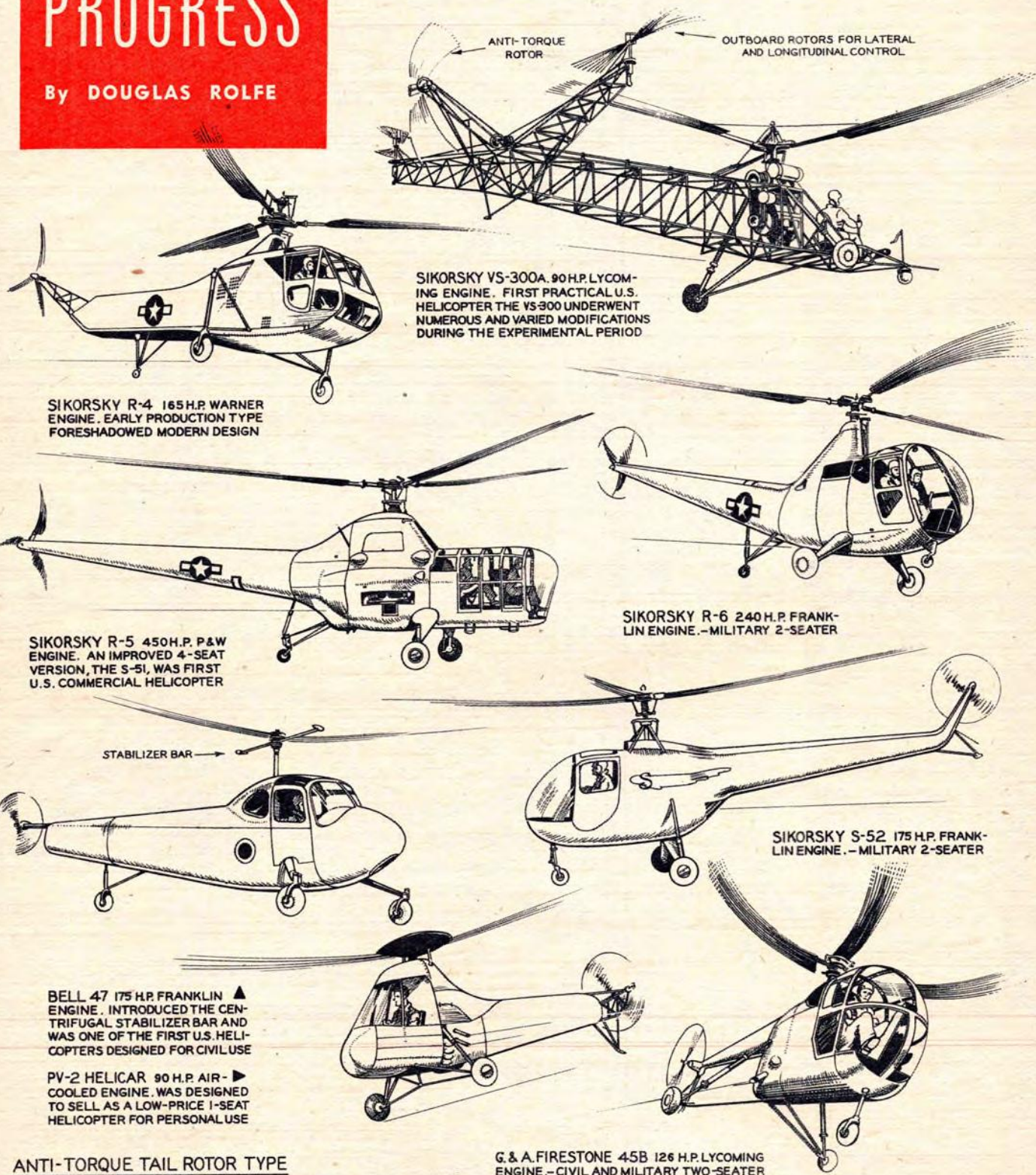


# AIR PROGRESS

By DOUGLAS ROLFE

## American Helicopter Revue

### PART II—THE FIRST DECADE



#### ANTI-TORQUE TAIL ROTOR TYPE

Although many people are under the impression that Igor Sikorsky invented the helicopter, this is not the case. What is true is that his model VS-300 was the first practical and truly successful helicopter, and all subsequent development of this form of flight may be said to stem from it. Still in its infancy when compared with normal airplane develop-

ment, the helicopter has made spectacular strides since the day Sikorsky took his clumsy-looking craft up and demonstrated for the first time the ability to take off and descend vertically; to hover indefinitely and to fly forwards, backwards and sideways with the machine at all times under complete control. See February issue for details.

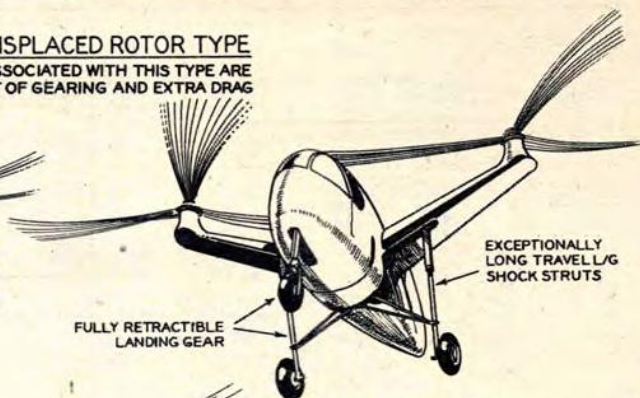


# LATERALLY DISPLACED ROTOR TYPE

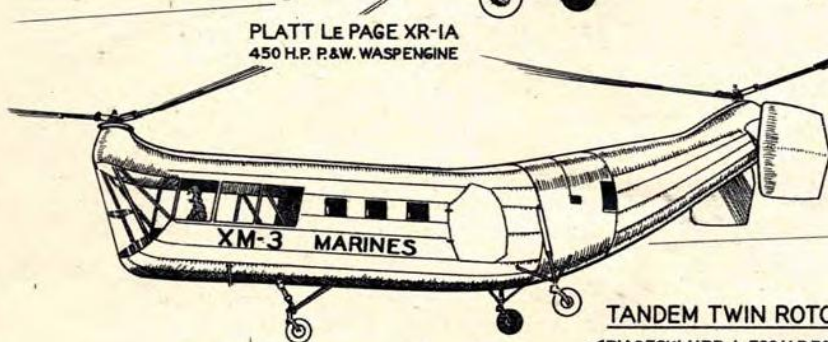
DISADVANTAGES ASSOCIATED WITH THIS TYPE ARE INCREASED WEIGHT OF GEARING AND EXTRA DRAG



PLATT LE PAGE XR-1A  
450 H.P. P&W. WASP ENGINE



LANDGRAF H-2 85 H.P. POB JOY  
ENGINE. FEATURED SIMPLE CONTROL



## TANDEM TWIN ROTOR TYPE

PIASECKI HRP-1. 500 H.P. P&W ENGINE  
H.E.R.C. JOV. 13. 125 H.P. LYCOMING ENGINE



## INTERMESHING TWIN (EGGBEATER) ROTOR TYPE

KELLET XR-1. TWO 450 H.P. P&W  
ENGINES. FIRST OF THIS TYPE.  
KAMAN K-190. 190 H.P. ENGINE

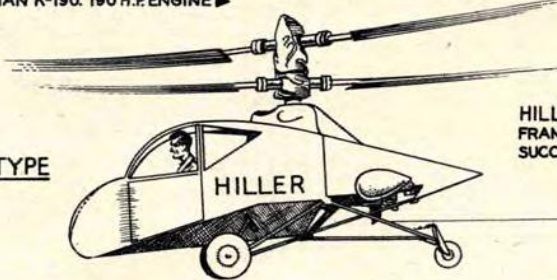


DOUGLAS  
ROLFE



PENTECOST HOPPI-COPTER  
40 H.P. ENGINE. SMALLEST  
HELICOPTER IN THE WORLD.

## CO-AXIAL ROTOR TYPE



HILLER-COPTER 90 H.P.  
FRANKLIN ENGINE. FIRST  
SUCCESSFUL COAXIAL TYPE



MARQUARDT M-14. WORLD'S  
FIRST PULSE-JET HELICOPTER

## JET-PROPELLED ROTOR TYPE



MCDONNELL XH-20 "LITTLE HENRY"  
WORLD'S FIRST RAM-JET HELICOPTER.

Nor must it be forgotten that the development of the helicopter is due in large measure to the pioneering efforts of Cierva and others who in developing the autogiro, first successful rotary wing airplane, discovered the principle of the articulated rotor blade and methods for its control.

On these pages are displayed examples of the basic types

of helicopters introduced during the first decade of helicopter flight. They form an interesting study in the various approaches to the problem by different designers with their own ideas on configuration and methods of control. The anti-torque tail rotor type occupies the entire left-hand page, while the right-hand page is devoted to various other designs.